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The Vascular Flora of Jamestown Island, James City County, Virginia

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THE VASCULAR FLORA OF JAMESTOWN ISLAND
JAMES CITY COUNTY, VIRGINIA

A Thesis

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APPROVAL SHEET

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ABSTRACT

Jamestown Island is a 1559.5 acre island, one-half of which lies in brackish marsh and the greater proportion of the remainder in stages of old field succession. The Island is located southwest of Williamsburg in James City County, Virginia, at the mouth of Powhatan Creek on the James River.

Six vegetational areas (mixed deciduous woods, successional pine woods, roadsides and old fields, low areas, brackish marsh and sandy shores), are recognized. The effects of deer browsing and grazing, mowing, flooding and 300 years of human occupation on the diversity and abundance of the Island's vascular flora are discussed.

Collections of the vascular flora of Jamestown Island were made biweekly during the growing season, June 1969 - June 1970. Voucher specimens are deposited in the Herbarium of the College of William and Mary. A total of 491 taxa of 306 genera of 95 families are recorded. New county records, Peninsula records and state records are indicated on a checklist of the flora, and are discussed when they represent extensions in the species range. A key to the taxa represented has been prepared and data on relative abundance and habitat are included for each species.

THE VASCULAR FLORA OF JAMESTOWN ISLAND

INTRODUCTION

> The nineteenth day, my selfe and three or foure more walking into the Woods, by chance wee espied a pathway like to an Irish pace: wee were desirous to knowe whither it would bring vs. Wee traced along some foure miles, all the way as wee went, hauing the pleasantest Suckles, the ground all flowing ouer with faire flowers of sundry colours and kindes, as though it had beene in any Garden or Orchard in England. There be many Strawberries, and other fruits vnknowne. Wee saw the Woods full of Cedar and Cypresse trees, with other trees (out of) which issues our sweet Gummes like to Balsam. Wee kept on our way in this Paradise. (Smith 1895)

Such was the English settler George Percy's description on May 19, 1607, of Jamestown Island, site of the first permanent English settlement in North America. For most of its history from the time of colonization, the Island, though riddled with marsh, has been under cultivation and could not boast a rich flora. The natural vegetation is returning, but much of the high ground is still unmistakably in old field succession. Jamestown Island may be said to have been first studied botanically by Lawrence Bohun who collected herbs there for medicinal purposes in 1610. As a part of The Peninsula of Virginia, the Island may have been studied by John Banister who lived in the colony from 1678 and worked in Charles City County, or by Mark Catesby, whose first American field work was centered in Williamsburg from 1712-1719. In the eighteenth century, John Mitchell compiled lists of Virginia plants and John Clayton collected the specimens from which Gronovius compiled the Flora Virginica in 1739 (Davis 1964).

In the twentieth century, Professor and Mrs. E. J. Grimes, who

collected on The Peninsula in 1920-21, seem to have excluded Jamestown Island, which is understandable as it was at that time under private ownership. Recent collections on the Island were made by Robert C. Bruce and John Wesley Phillips, two naturalists with the Colonial National Historical Park, whose 50+ collections are deposited in the Herbarium at the Jamestown Island Information Center. More significantly, Bruce began a wildflower manuscript intended for the use of Island visitors which has not been completed.

Recognizing the significance of its history, the permanent preservation of its flora as part of a national park, as well as the interest inherent in its geography as an island, I selected Jamestown Island, James City County, Virginia, for this floristic study. This study of the Island adds to the floristic record of James City County, previously based on the work of Erlanson (1924), Harvill (1964) and most recently Barans (unpubl. M.A. thesis, 1969). Results of this survey may also provide a background for vegetation studies connected with a deer management program on the Island. The study also will make available to the tourist facility at Jamestown Island information which might lead to publication of a wildflower or nature guide.

The field work for the study was begun in June 1969 and biweekly collecting trips were made to the Island through June 1970. Voucher specimens have been deposited in the Herbarium of the College of William and Mary. Keys leading to the identification of the families, genera and species represented have been prepared and abundance and habitat information included. A checklist of the Island's vascular flora with information on new records is included.

CHAPTER I

THE ISLAND

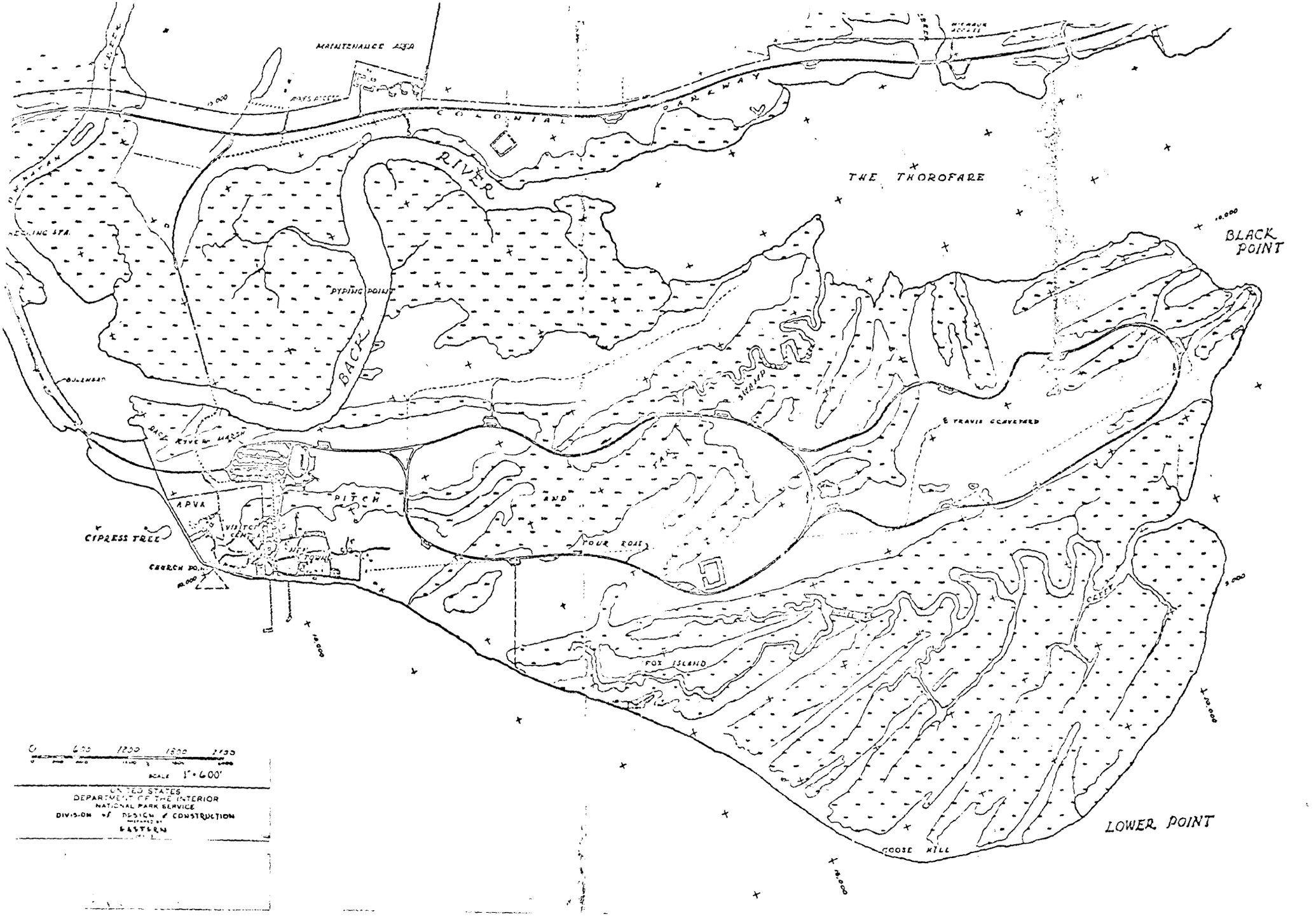
Description

Jamestown Island lies southwest of Williamsburg in James City County, Virginia, at the mouth of Powhatan Creek. Once completely an island, it is presently joined to the mainland by a bridge and a causeway called "the Isthmus" built in 1956. The Island's northern shore is separated from the mainland by Back River which flows from Powhatan Creek and by the Thorofare; the remaining three shores are open to the James River. The Island is based on more than 300 feet of fine sand and topped with a few feet of clay and silt merging into topsoil (Cotter 1958). Of the Island's 1,559.5 acres, 812 lie in brackish marsh and sluggish inlets; the remaining 747.5 acres are in low land (Waddell 1930), crossed by a few higher ridges providing a minimum relief. The maximum elevation is less than twenty feet above mean low tide. Water often collects in the low parts of the Island, maintaining them as swampy areas.

The Island is perhaps a few thousand years old, initially being a series of sandy bars or shoals formed with the rise of the sea level. With soil erosion from the mainland, the shoals became a peninsula with Powhatan Creek on the north and the James River on the south. South of the peninsula, deposits later built up Goose Hill, a series of sandbar formations extending like fingers from a sandy beach. Marshes were formed, those between the fingers constituting Passmore Creek, and

FIGURE I

Map of Jamestown Island


MAINTENANCE AREA
COLONIAL PARKWAY
THE THOROFARE
BLACK POINT
PYPING POINT
BACK RIVER
BACK RIVER MARSH
SHELLMAN
SHELLMAN
APVA
PITCH
AND
VISITOR CENTER
CYPRESS TREE
CHURCH POINT
FOUR ROAD
FOX ISLAND
GOOSE HILL
LOWER POINT
SCALE 1" = 600'
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DIVISION of DESIGN & CONSTRUCTION
EASTERN

those on the Powhatan Creek side forming a border along winding Back River, which opens into the Thorofare. The marshes now extend into the area of the high ground, the largest one being the Pitch and Tar Swamp, drained by Kingsmill's Creek, where bog iron was once deposited (Cotter 1958).

Erosion, the very process that built the Island, supplemented by wave action, once threatened to destroy it. Erosion of the waterfront at the upstream end of the Island was checked in 1903 with the construction of a seawall, but an estimated 500 feet of land had been lost to the river by that time. A lone cypress, presently 400 feet from this wall, marks the approximate low tide-line along this shore in 1848. A granite riprap was constructed in 1935 along much of the James River waterfront to check erosion in that area.

Historical Background

From the 1607 description by George Percy of a lush vegetation, it may be speculated that the forests of the Island had a richer natural understory than at present. Archaeological evidence suggests that the Algonquians occupied the Island within one hundred years previous to 1607. The first English fort was built on a projection of the main island which in 1607 extended almost to the channel of the river. The settlement spread from "James Citty" along the shore of the James River to Orchard Run, the latter area constituting "New Towne". Although the seat of government, the Island's population was never large and declined following a 1698 fire which precipitated the removal of the capitol to Middle Plantation (Williamsburg). Through the eighteenth century, the Island was the estate of two families, the Amblers and the Travises, and the ruins of the mansion of the former stand today. The

Island's other obvious feature, the earthworks of a Civil War fort, one of four on the Island, attest to the role of the Island in the Confederate defense of Richmond.

From the 1880's until 1934, the Island was owned and farmed by the Edward E. Barneys. In 1893, 22.5 acres of the old townsite were given to the Association for the Preservation of Virginia Antiquities (APVA), while the remainder of the Island came under the supervision of the National Park Service in 1934 and was then included within the boundaries of the Colonial National Historical Park.

Park Service buildings, restored areas and currently maintained roads, including the Island Loop Roads, are indicated in Figure I.

CHAPTER II

THE FLORA

Limitations

The diversity and abundance of the vascular flora of Jamestown Island have been limited by several factors, the most obvious being man's former agricultural activities. Significant, too, is the browsing and grazing of a population of white-tailed deer (Odocoileus virginianus), which in the past has so increased beyond the carrying capacity of the Island that deer have been removed from the Island to alleviate the situation. The present estimated population of 125 head knows no natural enemies except wood ticks, a severe infestation of which may be fatal to young deer. Deer browsing is not restricted to any one portion of the Island although the animals aggregate in one major "deer pen", an open-floored young elm stand in the area circled by the Long Loop Road. The deer seem to be the chief factor in maintaining various woodland clearings in a lawn-like condition through the spring. Only in late summer are these clearings filled in with the ubiquitous wing-stem, Verbesina occidentalis. Two deer exclosures have been constructed but superficial examination shows no vegetational differences with adjoining areas, probably because neither pen is in an area of frequent deer visitation. Deer browsing does appear to limit vegetative reproduction; for instance, it is a factor in the very limited success of young Magnolia grandiflora saplings, but the significance or even the actuality of deer-induced changes in the vegetational

composition has not been determined.

A controlling factor also is the flooding of the lowest parts of the Island following heavy rainfall, due to the poor runoff. Flooding during a period of heavy rains in the summer of 1969 was observed to effectively destroy all existing vegetation in several disturbed wooded areas. In several low areas of woods, swampy pools of shallow standing water are constantly present, except perhaps in the very driest part of the growing season. Additionally, mowing, although sporadic, of the grassy waysides along the Island's approximately six miles of road and of the single remaining old field, has limited the growth of weedy species. The human factor is presently insignificant, the healthy tick, deer fly, chigger and mosquito populations serving as effective deterrents to Island visitors, who with the exception of an occasional duck-hunter or fisherman, remain in their cars except in the town-site area.

It is interesting to note the effects of 300 years of human occupation on the vascular flora of Jamestown Island. Among those trees, shrubs and herbs commonly observed by the first settlers, as reported by Cotter (1958), some remain conspicuous in the Island's flora today. These plants, whether persistent through the centuries or reestablished, include:

pine	*Pinus virginiana*
cypress	*Taxodium distichum*
cedar	*Juniperus virginiana*
water flag	(?) *Typha* spp.
briar	*Smilax* spp., *Rubus* spp.
myrtle	*MyrJuniperus virginiana*
walnut	*Carya* spp., *Juglans nigra*
alder	*Alnus* spp.
oak	*Quercus* spp.
elm	*Ulmus* spp.
red mulberry	*Morus rubra*, *M. alba*
maracocks, mayapples	*Podophyllum peltatum*
tulip poplar	*Liriodendron tulipifera*

sassafras	Sassafras albidum
blackberry, dewberry, black raspberry	Rubus spp.
cherry	Prunus serotina
locust	(?) Robinia pseudo-acacia Gleditsia triacanthos
sumac	Rhus spp.
holly	Ilex opaca
wild grape	Vitis spp.
dogwood	Cornus florida
whortleberry	Gaylussacia baccata
cranberry	Vaccinium spp.
persimmon	Diospyros virginiana
ash	Fraxinus spp.
honeysuckle	Lonicera spp.
snakeroot	Eupatorium rugosum, other genera

Conspicuous in their absence from the twentieth century flora of the Island are a few species said to be commonly observed in the seventeenth century. These absent species include:

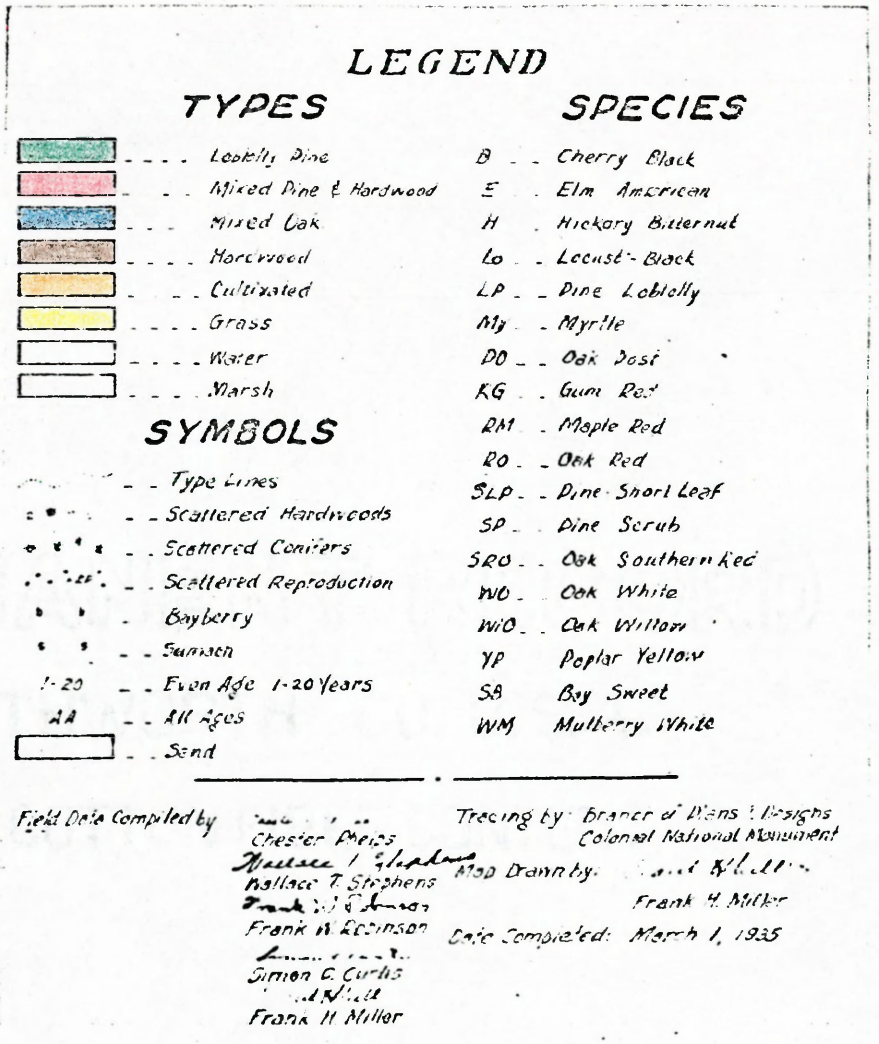
balsam	Abies spp.
wild oats	Avena fatua, Uniola paniculata
maize	Zea mays
hazel	Corylus spp.
chestnut	Castanea dentata
chinquapin	Castanea pumila
live oak	Quercus virginiana
gooseberry	Ribes spp.
crab apple	Crataegus spp.
strawberry	Fragaria spp.
beans	Phaseolus spp.
sugar maple	Acer saccharum
laurel	Kalmia latifolia
puccoon	Lithospermum spp.
Jimson weed	Datura stramonium
tobacco	Nicotiana rustica
muskmelons	(?) native
squashes, gourds, & pumpkins	Cucurbita spp.

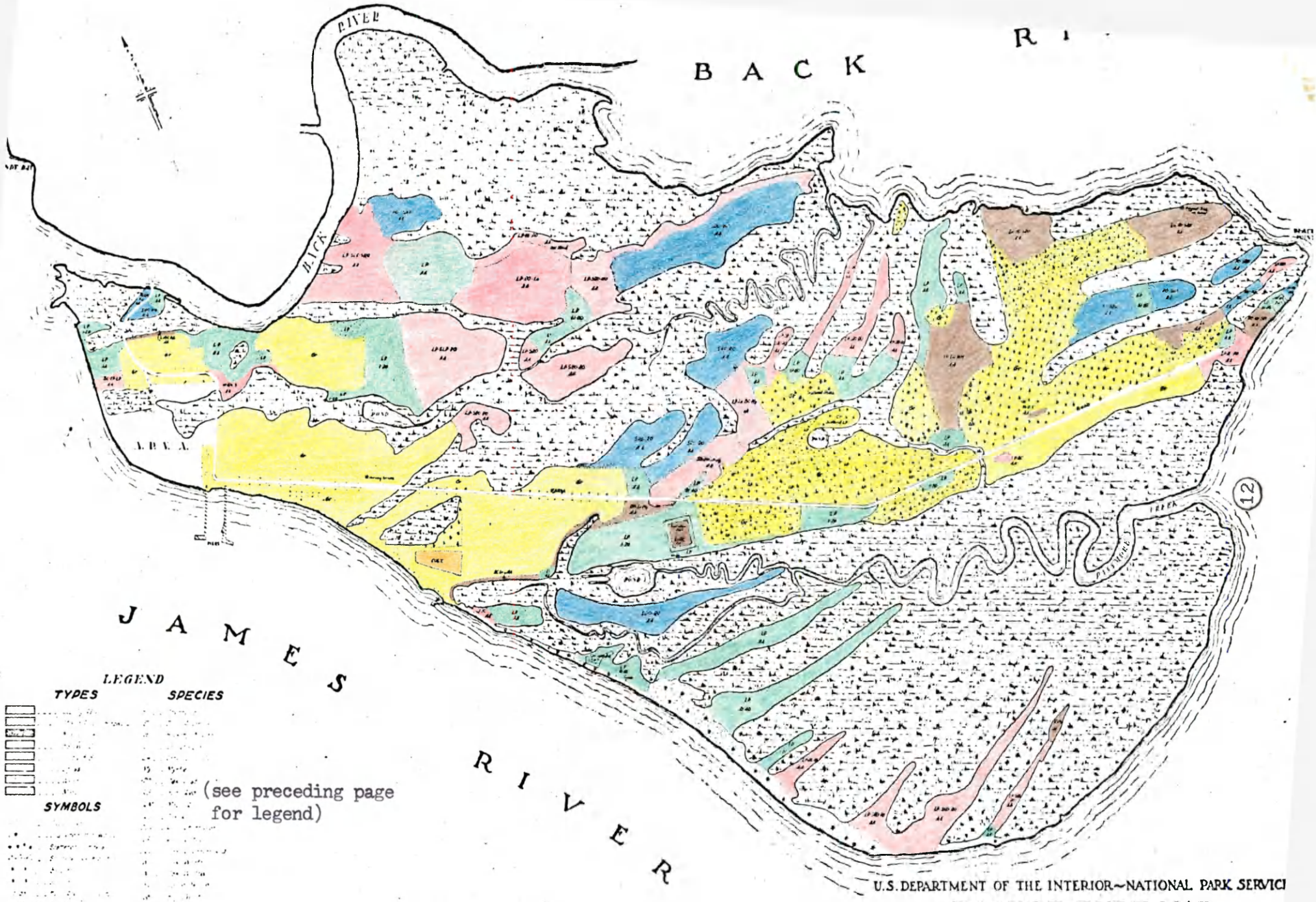
Some of these species obviously were once cultivated on the Island; others may be listed erroneously due to misidentification or ambiguous common names. It seems unlikely, for example, that the species known commonly today as balsam fir and cranberry were native on the Island in historic times.

FIGURE II

U.S. DEPARTMENT OF THE INTERIOR—NATIONAL PARK SERVICE

FOREST TYPE MAP
JAMESTOWN ISLAND
COLONIAL NATIONAL MONUMENT




BACK
JAMES
RIVER
LEGEND
TYPES
SPECIES
SYMBOLS
(see preceding page for legend)
U.S. DEPARTMENT OF THE INTERIOR—NATIONAL PARK SERVICE
FOREST TYPE MAP
JAMESTOWN ISLAND
COLONIAL NATIONAL MONUMENT
SCALE
FEET

Vegetation Patterns

The present vegetation of Jamestown Island can be arbitrarily divided into six groupings: (1) mixed deciduous woods, approximately 18%, (2) successional pine woods, 22%, (3) roadsides, old fields and waste places, 1%, (4) low ground where the water table is near the soil surface, 1%, (5) brackish marshes, 52% and (6) sandy shores, 2%. The remaining acreage, amounting to 4% of the total area, is in the tourist facility, including the property of the APVA.

The Island's mixed deciduous woods are variants of an oak-hickory climax characteristic of the Coastal Plain of Virginia north of the James River, an area included in the Oak-pine Region of Braun (1950). There is nothing suggestive of an uplands area nor of a ravine; relief is provided by banks above Back River, depressions of uprooted trees and rows of undulations of the floor, presumably from the time of early cultivation. The remains of the Confederate forts provide steep banks in some areas. Mixed deciduous woods include approximately 135 acres of mixed hardwoods and 150 acres of hardwoods with large relict canopy pines.

Dominating the canopy are Quercus falcata, Q. stellata, Q. alba, Carya spp. and Liquidambar styraciflua. Prunus serotina, Acer rubrum and Diospyros virginiana are occasional canopy species and Juglans nigra, Morus spp., Celtis occidentalis and Robinia pseudo-acacia are in the canopy of disturbed areas. Ilex opaca and Cornus florida are abundant in the understory; however, the shrub layer is not extensive except for Rhus radicans and Gaylussacia spp. Notably rare tree species include Fagus grandifolia, Carpinus caroliniana, Amelanchier canadensis and Oxydendrum arboreum, each found on the Island only as a

single individual, and Castanea pumila and Magnolia virginiana which are apparently absent.

Colonies of Athyrium filix-femina, Onoclea sensibilis, Dryopteris thelypteris and Dennstaedtia punctilobula are common in the herb layer as well as Luzula bulbosa, Oxalis violacea, Galium spp., Houstonia caerulea, Elephantopus tomentosus, Eupatorium spp., Antennaria spp. and Hieracium venosum. Conspicuous in their absence are the herbaceous species Adiantum pedatum, Smilacina racemosa, Asarum spp., Hepatica americana, Anemone virginiana, Geum spp., Osmorhiza longistylis and Erigeron pulchellus.

Successional pine woods in two stages of development occupy approximately 345 acres total. About 115 acres are in pine stands greater than 40 years old and 230 acres are in young even-aged stands developed on agricultural fields abandoned in 1934. Pinus taeda forms the canopy over a scattered understory of Juniperus virginiana, and the ubiquitous Ilex opaca and Cornus florida, the latter two found chiefly in openings in the canopy. A sparse sapling-shrub layer of Magnolia grandiflora, Myrica cerifera, Gaylussacia spp. and Rhus radicans is located chiefly along the road-cuts as are Smilax spp., Lonicera japonica and Campsis radicans. The chief species of an incomplete herbaceous layer are Lycopodium complanatum var. flabelliforme, Polystichum acrostichoides, Asplenium platyneuron, Cypripedium acaule, Liparis lilifolia, Goodyera pubescens, Chimaphila maculata, Galium spp., Mitchella repens and Verbesina occidentalis.

Roadsides, old fields and waste places only amount to an estimated twenty acres of land, but in number of species account for the greater proportion of the Island's flora. Vegetation consists of herbaceous

species which in most areas are sporadically mowed, with Smilax spp., Myrica cerifera, Rubus spp., Vitis spp., Campsis radicans, Lonicera japonica and the tree species Ailanthus altissima, Paulownia tomentosa and Diospyros virginiana at the margins of road-cuts or in waste places.

Prominent vernal weedy species include Poa pratensis, Holcus lanatus, Anthoxanthum odoratum, Carex spp., Juncus tenuis, Ranunculus spp., Cardamine hirsuta, Duchesnea indica, Geranium carolinianum, Veronica arvensis, Senecio aureus and Krigia spp. In the summer these are replaced by Triodia flava, Elymus virginicus, Paspalum dilatatum, Panicum spp., Andropogon virginicus, Cyperus spp., Rumex spp., Trifolium spp., Lespedeza spp., Hypericum spp., Daucus carota, Plantago spp., Diodia spp., Solidago spp., Erigeron spp., Verbesina occidentalis, Hypochoeris radicata and Pyrrhopappus caroliniana. Locally abundant near Williamsburg but absent from the Island's roadsides and fields are Phleum pratense, Bulbostylis capillaris, Datura stramonium and Veronica agrestis.

Sunken areas where the water table is near the soil surface amount to an estimated 15 acres and include low ground adjacent to the marshes, swampy areas of the woods and an often flooded meadow. Characteristic tree species include Taxodium distichum, Salix nigra, Quercus phellos, Ulmus spp., Persea borbonia, Acer rubrum, Nyssa sylvatica and Diospyros virginiana. Characteristic herbaceous species are Osmunda regalis, Dryopteris thelypteris, Sagittaria falcata, Carex spp., Peltandra virginica, Lemna minor, Boehmeria cylindrica, Ceratophyllum echinatum, Impatiens capensis, Hydrocotyle verticillata, Cicuta maculata, Mikania scandens and Cirsium horridulum.

Although the collections from this habitat include several

uncommon species which are new records, several species characteristic of this habitat elsewhere are absent or nearly so from the Island. These absent species include Alnus serrulata, Leersia oryzoides, Orontium aquaticum, Saururus cernuus, Nuphar advena, Nasturtium officinale and the submerged aquatics.

Over one-half of the Island lies in brackish marsh drained by sluggish meandering inlets. The marsh is uniform with respect to its flora, the greatest diversity being along the edges of inlets and at the margins where the marsh meets sunken areas or sandy shores. Dominant in the Jamestown Island marshes is Spartina cynosuroides. Common and characteristic species are Typha spp., Erianthus giganteus, Eleocharis ambigens, Scirpus americanus, S. rubricosus, Peltandra virginica, Pontederia cordata, Rumex verticillatus, Acnida cannabina, Rosa palustris, Kosteletzkya virginica and Hibiscus palustris forma peckii.

The sandy shores and low dunes above the James River comprise approximately 25 acres of the Island's total area. Vegetation is neither diverse nor extensive but includes Pinus taeda, Taxodium distichum and Nyssa sylvatica among tree species; Rhus copallina, Hudsonia tomentosa and Baccharis halimifolia among shrubs; and Spartina alterniflora, Panicum amarum, Cenchrus tribuloides, Tripsacum dactyloides, Chenopodium ambrosioides, Opuntia humifusa, Lilaeopsis chinensis, Aster tenuifolius, Xanthium strumarium and Bidens spp. as prominent herbs.

Floristic Records

Collections from Jamestown Island, James City County, Virginia, represent 485 species of 306 genera of 95 families. Six species are represented on the Island by two infraspecific taxa. Among 79 new James City County records, 56 taxa are newly reported for The Peninsula of Virginia and five taxa are reported as new from the state of Virginia. As the flora of Virginia is currently being investigated by several dozen active collectors, it is difficult to determine unequivocally which records, beyond those published by Massey (1961) and a few other works, are actually new for a given county or larger area. Species persisting or spreading from cultivation are not included as new records.

All of the possible new state records, Spiranthes odorata (S. cernua var. odorata), Polygonum opelousanum var. adenocalyx, Vicia dasycarpa, Myosotis stricta and Physalis heterophylla var. nyctaginea, are of taxa to be expected in Virginia according to the ranges given by Fernald (1950). Collections from Jamestown Island of Azolla caroliniana (previously recorded only from New Kent County), Ceratophyllum echinatum (Montgomery County), Cuscuta campestris (York County), Pycnanthemum tenuifolium (Warren County) and Solanum americanum (northern piedmont) apparently represent the second record of each for the state.

The Island collections of Hudsonia tomentosa, Hydrocotyle verticillata var. triradiata, Centella erecta and Pluchea foetida extend the known western limit of their Virginia ranges. Each species is known from swamps, shores and low ground of Virginia and the Carolinas; however, previous Virginia collections have been restricted

to the Outer Coastal Plain.

Eastward extensions of the Virginia range of Carex retroflexa, C. annectens, C. complanata, C. swanii, C. blanda, C. typhina, C. gravii var. hispidula, Iris prismatica, Quercus falcata var. pagodaefolia, Geranium molle, Polygala verticillata var. ambigua, Fraxinus americana var. biltmoreana, Gonolobus suberosus, Kickxia elatine, Veronica serpyllifolia, V. hederaefolia and Hieracium pratense are represented by the Island collections. The numerous Carex extensions are insignificant in their overall species ranges as all are recorded from the Coastal Plain of North Carolina; these collections merely supplement the scanty records of the genus in Virginia. The weedy species Geranium molle and Hieracium pratense have not previously been recorded from counties east of the Fall Belt in either Virginia or North Carolina.

The southern limit of Smilax tamnoides in Virginia has been extended from the northern Piedmont counties to Jamestown Island; however, this record merely fills a gap in the distribution as the species is overall southern (Texas to Virginia) in its range. The northern limits of Dryopteris celsa, Eleocharis ambigens, Ludwigia palustris var. nana, Asclepias lanceolata and Solidago microcephala, of sandy shores, brackish marshes and low ground, and of Hypericum gymnanthum, Rhexia ventricosa and Chaerophyllum tainturieri, of roadsides and grassy waysides, are extended north of the James River by the Jamestown Island collections.

CHAPTER III

THE KEYS AND THE CHECKLIST

Methods

The Key to Families and the Treatment of Families were adapted from Fernald (1950), Gleason (1952), Blomquist and Oosting (1959) and Radford, Ahles and Bell (1968). The sequence of plant taxa, scientific nomenclature and common names are those of Fernald (1950). Relative abundance is indicated by the categories rare, occasional, fairly common, common and abundant, an imprecise but usable hierarchy which suggests the frequency with which a species may be found on Jamestown Island. Habitat information applies to the Island alone. The author's collection numbers of the specimens are cited.

All of the taxa listed in the Checklist of the Vascular Plants of Jamestown Island were collected between 4 June 1969 and 4 June 1970. A voucher specimen of each of the entries has been deposited in the Herbarium of the College of William and Mary; duplicates of many will be distributed to other universities. One asterisk preceding the binomial name indicates that the species was not reported by Massey (1961), Erlanson (1924) or Harvill (1964) for James City County. Two asterisks indicate a record for The Peninsula (Hampton City and Warwick, York, James City, Charles City and New Kent Counties), while three asterisks indicate a new state record. The notation (a) following the asterisks indicates a previous but unpublished record of Barans (1969). Several species thought to be present on the Island but not collected have been

omitted from the checklist [*Botrychium dissectum* Spreng.; *Pinus echinata* Mill.; *Phoradendron flavescens* (Pursh) Nutt.].

KEY TO FAMILIES

a. Both gametophyte and sporophyte generations becoming physiologically independent at maturity; latter herbaceous, usually perennial, producing spores from more or less evident sporangia; true seeds not produced..... Division I. Pteridophyta (p. 21)
a. Gametophyte generation never becoming physiologically independent; sporophyte herbaceous or woody, producing pollen and true seeds, the latter containing the embryo sporophyte
.....Division II. Spermatophyta... b.
b. Plants woody, with resinous juice; leaves linear, needle-like or scale-like; pollen produced from scaly aments; ovules and seeds naked, borne on the surface of scales of a cone, the latter becoming large and woody or bluish and drupe-like
.... Subdivision I. Gymnospermae (p. 22)
b. Plants woody or herbaceous; leaves often broad; pollen and ovules produced in flowers, the ovules borne within a closed ovary which at maturity becomes a fruit, enclosing the seeds
..... Subdivision II. Angiospermae... c.
c. Plants herbaceous (shrubby in Arundinaria, Yucca, Smilax); stems with separate and scattered vascular bundles; leaves mostly parallel-veined, often grass-like; parts of the flower usually in threes or sixes, or fewer by reduction; seeds with a single cotyledon..... Class I. Monocotyledoneae (p. 22)
c. Plants herbaceous or woody; stem with vascular bundles in a ring, surrounding a central pith; leaves mostly netted-veined; parts of the flower in twos, threes, fours or fives or their multiples; seeds with two cotyledons
..... Class II. Dicotyledoneae... d.
d. Plants trees, shrubs, or woody vines; stems persisting through the winter..... Section I. Woody plants (p. 23)
d. Plants herbs; overground stems in most species dying at the close of the season
.. Section II. Herbaceous plants (p. 28)

DIVISION I. PTERIDOPHYTA. Ferns and fern-allies.

a. Plants free-floating, moss-like, less than 1 cm. in diameter; stems pinnately branched; leaves minute, two-lobed, imbricated; spores borne in sporocarps in pairs beneath the stem..... 5. SALVINIACEAE
a. Plants terrestrial or emergent; spores not formed in basal sporocarps... b.
b. Stems elongate, on or near surface of ground; leaves small, numerous, imbricated..... 1. LYCOPODIACEAE
b. Stems subterranean rhizomes or crowns; fronds relatively large, not scale-like... c.

c. Fertile fronds or fertile portions of fronds like the sterile in form and structure; sporangia clustered, borne on backs or at margins of the frond, covered by the indusium ..... 4. POLYPODIACEAE

c. Fertile fronds or fertile portions of fronds different from the sterile in form and structure... d.

d. Plants with a single frond, with an erect spore-bearing portion forming a spike or panicle and a posterior sterile blade..... 2. OPHIOGLOSSACEAE

d. Plants bearing several fronds... e.

e. Rhizome stout with fronds clustered at summit; sterile fronds once-pinnate or bipinnate; sporangia naked ..... 3. OSMUNDACEAE

e. Rhizome elongate, with scattered fronds; sterile frond sinuate or coarsely pinnatifid; sporangia with indusia. (Onoclea)..... 4. POLYPODIACEAE

DIVISION II. SPERMATOPHYTA. Seed plants.

Subdivision I. Gymnospermae.

Plants woody, with resinous juice; leaves linear, needle-like or scale-like; pollen produced from scaly aments; ovules and seeds naked, borne on the surface of scales of a cone, the latter becoming large and woody or bluish and drupe-like..... 6. PINACEAE

Subdivision II. Angiospermae.

Class I. Monocotyledoneae.

a. Plants free-floating, minute, stemless; body a frond or fronds, flattish or globe-like; rootlets 0-many, descending from lower surface; flowers minute, monoecious, borne in the margin or at the surface..... 12. LEMNACEAE

a. Plants rooting; stems present; leaves present... b.

b. Perianth absent, or bristle-like, chaffy, or scale-like; fruit not a capsule... c.

c. Flowers inconspicuous, in axils of imbricated or distichous, chaffy or husk-like scales, forming spikes or spikelets... d.

d. Culms terete, usually hollow; cauline leaves 2-ranked; leaf-sheaths usually open; flowers each enclosed in two bractlets..... 9. GRAMINEAE

d. Culms 3-angled, usually solid; cauline leaves 3-ranked or absent; leaf-sheaths closed; flowers each subtended by a single bractlet..... 10. CYPERACEAE

c. Flowers conspicuous although individually minute, not in axils of chaffy bracts... e.

e. Leaves linear, parallel-veined; flowers crowded in a terminal spike; perianth of numerous capillary bristles; fruit achene-like..... 7. TYPHACEAE

e. Leaves compound or sagittate, pinnately veined; flowers crowded on a fleshy axis, subtended by a spathe; perianth none; fruit a berry or berry-like..... 11. ARACEAE

b. Perianth present, petaloid (scale-like in Juncaceae, with capsule fruits)... f.
f. Ovary or ovaries superior... g.
g. Carpels numerous, distinct, aggregated into a subglobose head; inflorescence racemose; flowers whorled in threes; perianth of 3 sepals and 3 white petals; fruit an achene ..... 8. ALISMATACEAE
g. Carpels united in a compound ovary... h.
h. Perianth irregular, more or less bilateral; stamens dissimilar... i.
i. Plants terrestrial; flowers enclosed by a spathe; sepals herbaceous; petals colored; fertile stamens 3 (Commelina)..... 13. COMMELINACEAE
i. Plants aquatic; inflorescence a spike, subtended by a spathe-like leaf-sheath; sepals and petals both colored, the perianth funnelform; fertile stamens 6 ..... 14. PONTEDERIACEAE
h. Perianth regular; stamens all fertile, similar... j.
j. Plants rushes; perianth dry, bract-like, green to brown or purplish, persistent..... 15. JUNCACEAE
j. Plants various; perianth herbaceous or petaloid; corolla not persistent... k.
k. Perianth of herbaceous calyx and colored corolla; stamens 2 or 3. (Ancilema)..... 13. COMMELINACEAE
k. Perianth not differentiated into calyx and corolla, divisions similarly colored; stamens 6 ..... 16. LILIACEAE
f. Ovary wholly or partly inferior... l.
l. Corolla distinctly bilabiate, the third petal different in form, size and color from the lateral; stamens 1 or 2, united with the style to form a central column ..... 20. ORCHIDACEAE
l. Corolla regular or nearly so; stamens 3 or more... m.
m. Plants twining vines; leaves broad, netted-veined, often whorled; flowers unisexual; corolla greenish ..... 17. DIOSCOREACEAE
m. Plants erect herbs; leaves narrow, parallel-veined; flowers perfect; corolla variously colored... n.
n. Plants scapose; corolla yellow, white or pinkish; stamens 6; anthers introrse..... 18. AMARYLLIDACEAE
n. Plants leafy-stemmed; corolla blue to purple; stamens 3; anthers extrorse..... 19. IRIDACEAE

Class II. Dicotyledoneae.

Section I. Woody Plants.

a. Leaves and leaf-scars opposite or whorled... b.
b. Petals united into a gamopetalous corolla... c.
c. Ovary inferior... d.
d. Inflorescence racemose; flowers aggregated in heads, surrounded by an involucre of imbricated bracts, imperfect, cream-colored; fruit an achene. (Iva)..... 95. COMPOSITAE

d. Inflorescence a terminal head or cyme or axillary; flowers not in involucrate heads, perfect... e.
e. Leaves entire, often whorled; flowers white, densely aggregated in large spherical peduncled heads; fruit a capsule. (Cephalanthus)..... 90. RUBIACEAE
e. Leaves simple or pinnate; flowers in a terminal cyme or paired in the axils; fruit a drupe or berry ..... 91. CAPRIFOLIACEAE

c. Ovary superior... f.
f. Corolla irregular... g.
g. Corolla violet; plant flowering before the leaves; capsule woody, ovoid; seeds minute. (Paulownia) ..... 86. SCROPHULARIACEAE
g. Corolla white or orange to scarlet; capsule narrow, elongate; seeds flat, 2-winged..... 87. BIGNONIACEAE
f. Corolla regular... h.
h. Inflorescence a terminal panicle; corolla whitish; stamens 2, included; fruit a blackish berry. (Ligustrum) ..... 76. OLEACEAE
h. Inflorescence of axillary cymes; corolla bluish; stamens 4, exserted; fruit a pinkish drupe. (Callicarpa) ..... 83. VERBENACEAE

b. Petals distinct or absent... i.
i. Plants climbing or twining; sepals 4, petaloid; stamens numerous; fruit an achene with persistent plumose style (Clematis)..... 36. RANUNCULACEAE
i. Plants erect; sepals, stamens and fruit various... j.
j. Flowers with one floral envelope... k.
k. Leaves simple or compound with 3 or 5 leaflets; inflorescence of loose fascicles from below leafy tip; fruit two 1-seeded samaras..... 55. ACERACEAE
k. Leaves compound with 5-11 leaflets; inflorescence of crowded panicles from axils of preceding year's leaves; fruit a 1-2-seeded samara. (Fraxinus)..... 76. OLEACEAE
j. Flowers with a calyx and a corolla of distinct petals... l.
l. Leaves palmately veined, lobulate; fruit two 1-seeded samaras..... 55. ACERACEAE
l. Leaves pinnately veined, unlobed; fruit not a samara. m.
m. Stamens as numerous as the corolla lobes, 4 or 5.. n.
n. Plants shrubs; leaves serrate; flowers inconspicuous in loose axillary cymes; fruit a fleshy crimson capsule..... 54. CELASTRACEAE
n. Plants trees; leaves entire; flowers small, in close heads surrounded by an involucre of four large white petaloid bracts; fruit a small drupe ..... 71. CORNACEAE
m. Stamens more numerous than the corolla lobes... o.
o. Plants terrestrial shrubs; leaves punctate; calyx of 4 sepals, the outer leaf-like; corolla yellow; styles 2-5. (Ascyrum)..... 60. GUTTIFERAE
o. Plants trees or aquatic shrubs; leaves not punctate; calyx 5-7-toothed; corolla magenta to white; style 1..... 65. LYTHRACEAE

a. Leaves and leaf-scars alternate... p.

p. Leaves compound... q.
q. Leaves twice-compound... r.
r. Leaflets entire; inflorescence of small regular flowers in dense heads or of spiciform racemes of greenish flowers ..... 45. LEGUMINOSAE
r. Leaflets serrate; inflorescence paniculate... s.
s. Plants unarmed; inflorescence of showy lilac or lavender flowers; ovary superior; stamens with filaments united; fruit a large pale drupe..... 49. MELIACEAE
s. Plants prickly; inflorescence a compound panicle of umbels of small whitish flowers; ovary inferior; stamens 5, distinct; fruit a black berry-like drupe. (Aralia) ..... 69. ARALIACEAE
q. Leaves once-compound... t.
t. Plants climbing vines... u.
u. Plants climbing by aerial rootlets; leaves trifoliolate; stamens alternate with petals; fruit a dry whitish drupe ..... 52. ANACARDIACEAE
u. Plants climbing by tendrils; leaves palmately compound, the leaflets 5; stamens opposite petals; fruit a 1-4-seeded berry. (Parthenocissus)..... 58. VITACEAE
t. Plants erect, trees or shrubs... v.
v. Corolla absent; staminate flowers in elongate catkins, pistillate flowers solitary or in few-flowered spikes; fruit a nut covered by a fleshy or woody involucre ..... 23. JUGLANDACEAE
v. Corolla polypetalous; inflorescence not catkin-like; fruit a legume, samara, drupelet or achene... w.
w. Flowers papilionaceous; stamens 10, monadelphous or diadelphous; fruit a legume..... 45. LEGUMINOSAE
w. Flowers not papilionaceous; stamens numerous, distinct; fruit a drupelet, achene or samara... x.
x. Plants armed with thorns or prickles; leaflets 3-9, serrate; inflorescence variable, of showy white to roseate flowers; fruit an achene or drupelet..... 44. ROSACEAE
x. Plants unarmed; leaflets 11-25, 1-3-toothed at base; inflorescence paniculate, of small green or yellowish flowers; fruit a samara ..... 48. SIMAROUBACEAE

p. Leaves simple... y.
y. Plants climbing or twining vines... z.
z. Plants climbing by twining; leaves not lobed, with straight parallel veins; inflorescence paniculate or of axillary clusters; fruit a drupe..... 57. RHAMNACEAE
z. Plants climbing by tendrils or aerial rootlets; leaves 3-5-lobed; inflorescence not paniculate... a.
a. Plants with tendrils; leaves deciduous; inflorescence a compound thyrse; fruit a 1-4-seeded berry. (Vitis) ..... 58. VITACEAE
a. Plants with aerial roots; leaves evergreen; inflorescence umbellate; fruit a 3-5-seeded drupe. (Hedera) ..... 69. ARALIACEAE
y. Plants erect, trees or shrubs... b.

b. Flowers with one floral envelope or none c.
  c. Flowers unisexual, small, in catkins or catkin-like clusters or heads... d.
    d. Pistillate flowers solitary or in samll clusters, subtended by an involucre of numerous bracts; fruit a nut wholly or partly surrounded by a scaly cup or 4-valved prickly bur..... 25. FAGACEAE
    d. Pistillate flowers in aments, heads, dense spikes or cone-like structures... e.
      e. Pistillate flowers with a calyx... f.
        f. Plants without milky juice; leaves pinnately veined, unlobed, serrate; pistillate flowers in ovoid to cylindric catkins; fruit a nut or nutlet..... 24. CORYLACEAE
        f. Plants with milky juice; leaves palmately veined, toothed or lobed; pistillate flowers in short cylindric catkins; fruit short-cylindric, resembling a blackberry 27. MORACEAE
      e. Perianth of pistillate flowers absent... g.
        g. Leaves palmately veined, deeply 5-7-lobed; flowers arranged in globose heads on long peduncles; fruit a beaked woody capsule ..... 42. HAMAMELIDACEAE
        g. Leaves pinnately veined, unlobed; flowers arranged in short slender spikes... h.
          h. Leaves deciduous, not resin-dotted; flowers in elongate catkins; ovary many-ovulate; fruit a short capsule; seeds silky-hairy ..... 21. SALICACEAE
          h. Leaves evergreen, resin-dotted; flowers aggregated in short cylindric catkins, unisexual; ovary 1-ovulate; fruit a globose wax-coated nutlet..... 22. MYRICACEAE
  c. Flowers unisexual or perfect, not in catkins or globose heads... i.
    i. Leaves serrate, oblique at base; ovary superior; styles 2; stamens as many as perianth-lobes; fruit a samara or sweet drupe..... 26. ULMACEAE
    i. Leaves entire, not oblique-based; style one; stamens more numerous than perianth-lobes... j.
      j. Plants aromatic; flowers clustered, sessile, paniculate or in peduncled racemes, unisexual; ovary superior; fruit a 1-seeded berry or a drupe ..... 39. LAURACEAE
      j. Plants not aromatic; flowers clustered in a head terminating a long axillary peduncle, perfect or unisexual; perianth minute; ovary inferior; fruit a drupe..... 66. NYSSACEAE
b. Flowers with 2 floral envelopes, a calyx and corolla... k.
  k. Petals united into a gamopetalous corolla... l.
    l. Stamens more numerous than lobes of corolla... m.
      m. Flowers perfect; style 1; stamens 8 or 10; anthers opening by terminal pores; fruit a capsule or a berry with small seeds..... 73. ERICACEAE

m. Flowers polygamous; styles 4; stamens 8 or 16; anthers not opening by pores; fruit a large berry with 4-8 large hard seeds..... 75. EBENACEAE

l. Stamens not more numerous than lobes of corolla... n.

n. Inflorescence axillary, of solitary or of clustered flowers; petals 4-9; ovary superior; fruit a globose red drupe..... 53. AQUIFOLIACEAE

n. Inflorescence paniculate; flowers aggregated in heads surrounded by an involucre of imbricated bracts; ovary inferior; fruit an achene, crowned with a pappus of capillary bristles. (Baccharis) ..... 95. COMPOSITAE

k. Petals or petal-like parts distinct... o.

o. Flowers clustered in heads terminating long axillary peduncles, all unisexual... p.

p. Leaves palmately lobed; heads globose, dry, densely flowered; ovary superior; fruit 1-seeded nutlets, the latter tawny-hairy below ..... 43. PLATANACEAE

p. Leaves pinnately veined, unlobed; heads few-flowered; ovary inferior; fruit a drupe ..... 66. NYSSACEAE

o. Flowers not in heads, some or all of them perfect. q.

q. Stamens numerous, more than twice as many as petals... r.

r. Plants low, heath-like shrubs; leaves scale-like, imbricated, villous; inflorescence axillary, of bright yellow flowers. (Hudsonia) ..... 61. CISTACEAE

r. Plants trees or erect shrubs; leaf-blades broad... s.

s. Leaves entire, deciduous and lobed or evergreen and unlobed; calyx and corolla colored alike; petals 6-9; fruit samara-like or of follicles coherent in a woody cone ..... 38. MAGNOLIACEAE

s. Leaves dentate or serrate, deciduous, unlobed; inflorescence various; calyx foliaceous; petals 5; fruit a dehiscent follicle, or pome or drupe..... 44. ROSACEAE

q. Stamens few, twice as many as petals or less... t.

t. Stamens as numerous as petals... u.

u. Plants prickly shrubs; leaves entire; inflorescence umbellate, of small yellow flowers. (Berberis)..... 37. BERBERIDACEAE

u. Plants trees without prickles; leaves crenate or spiny-toothed; inflorescence axillary, of solitary or clustered whitish flowers..... 53. AQUIFOLIACEAE

t. Stamens twice as many as petals... v.

v. Leaves evergreen, lanceolate to lance-oblong; flowers in peduncled panicles or cymes, unisexual; perianth minute; fruit a blue drupe. (Persea)..... 39. LAURACEAE

v. Leaves deciduous, rounded, cordate, palmately veined; flowers perfect, papilionaceous, roseate; fruit a legume. (Cercis) ..... 45. LEGUMINOSAE

Section II. Herbaceous Plants.

a. Stems thick, fleshy, flattened, jointed, thorny or spinulose; foliage leaves lacking; flowers large, yellow; stamens numerous ..... 64. CACTACEAE

a. Stems of ordinary structure and proportions... b.
  b. Leaves opposite or whorled... c.
    c. Flowers with one floral envelope, or perianth absent (cyathium perhaps suggesting a calyx and corolla in Euphorbiaceae)... d.
      d. Flowers unisexual, clustered in a cup-like cyathium with white petaloid appendages; plants with milky juice. (Euphorbia)..... 51. EUPHORBIACEAE
      d. Flowers perfect, or if unisexual, not borne in a cyathium; plants without milky juice... e.
        e. Flowers unisexual... f.
          f. Plants monoecious, aquatic, frail; leaves finely dissected, whorled; inflorescence axillary, of solitary sessile flowers..... 35. CERATOPHYLLACEAE
          f. Plants dioecious, terrestrial; leaves simple; inflorescence spicate, leafy-tufted above, the flowers in remote glomerules..... 28. URTICACEAE
        e. Flowers perfect... g.
          g. Plants climbing or trailing; leaves compound; sepals petaloid; stamens numerous; fruit an achene with persistent plumose style. (Clematis) ..... 36. RANUNCULACEAE
          g. Plants erect or matted; leaves simple; fruit a capsule... h.
            h. Inflorescence cymose, terminal or of a solitary flower; flowers 5-merous; ovary superior .....34. CARYOPHYLLACEAE
            h. Inflorescence axillary, of sessile solitary flowers; flowers 4-merous; ovary inferior (Ludwigia)..... 68. ONAGRACEAE
    c. Flowers with two floral envelopes, calyx and corolla... i.
      i. Petals or petal-like parts distinct... j.
        j. Stamens numerous, more than twice as many as petals... k
          k. Leaves lobed or cleft, rarely entire, eglandular; petals with a nectariferous pit; ovaries many, simple; fruit an achene. (Ranunculus) ..... 36. RANUNCULACEAE
          k. Leaves entire, glandular-dotted; inflorescence cymose, terminal; ovary one, compound; fruit a many-seeded capsule..... 60. GUTTIFERAE
        j. Stamens few, twice as many as petals or less... l.
          l. Ovary inferior; flowers 4-5-merous and corolla yellow or flowers 2-merous and corolla white ..... 68. ONAGRACEAE

l. Ovary superior; corolla not yellow; flowers not 2-merous... m.
m. Stamens as many as petals and opposite them... n.
n. Plants succulent or fleshy; cauline leaves 2; inflorescence racemose, loose, terminal; sepals 2; corolla white or pink with deeper stripes; capsule ovoid..... 33. PORTULACACEAE
n. Plants not succulent; cauline leaves numerous; inflorescence axillary, of solitary flowers; sepals 5; corolla scarlet; capsule globose (Anagallis)..... 74. PRIMULACEAE
m. Stamens more numerous than the petals, or if same number, then alternate with them... o.
o. Leaves deeply lobed... p.
p. Leaves 1-2; flower solitary, borne in fork of stem; corolla white; ovary simple; fruit a large yellow berry. (Podophyllum) ..... 37. BERBERIDACEAE
p. Leaves numerous; inflorescence axillary, of pedicelled flowers; corolla roseate; ovary compound, the 5 carpels prolonged into beaks at maturity and separating ..... 47. GERANIACEAE
o. Leaves unlobed... q.
q. Petals 3... r.
r. Inflorescence racemose; flowers irregular, somewhat papilionaceous; corolla white to pink or rose; stamens united by their filaments..... 50. POLYGALACEAE
r. Inflorescence paniculate, leafy; flowers regular, minute; corolla red; stamens distinct. (Lechea)..... 61. CISTACEAE
q. Petals 4 or 5(-7)... s.
s. Leaves serrate... t.
t. Leaves deciduous, ribbed; corolla roseate; anthers exserted, upcurved; fruit a capsule surrounded by an urn-shaped calyx..... 67. MELASTOMATACEAE
t. Leaves evergreen, marked with white; corolla white; fruit a capsule, free from calyx. (Chimaphila) ..... 72. PYROLACEAE
s. Leaves entire... u.
u. Plants terrestrial; stems often swollen at nodes; inflorescence dichasial; flowers hypogynous; petals notched or fringed 34. CARYOPHYLLACEAE
u. Plants marsh herbs; inflorescence axillary, of subsessile flowers; flowers perigynous; petals entire ..... 65. LYTHRACEAE

i. Petals united into a gamopetalous corolla... v.
v. Ovary inferior, adnate to calyx-tube... w.
w. Flowers aggregated on a common receptacle into an

involucrate head; calyx-limb often modified into bristles or scales, never herbaceous; stamens united by their anthers into a tube; ovary 1-celled ..... 95. COMPOSITAE

w. Flowers not aggregated into a head; calyx herbaceous; ovary 2-5-celled... x.

x. Plants not conspicuously forked; inflorescence axillary, or if terminal, then flower solitary; flowers regular; ovary 2-celled; stamens 4-5; fruit dry or fleshy..... 90. RUBIACEAE

x. Plants dichotomously forked; inflorescence terminal, cymose, subtended by leafy bracts; flowers irregular; ovary 3-celled, 2 cells abortive; stamens 1-3; fruit dry 92. VALERIANACEAE

v. Ovary superior, free from calyx-tube... y.

y. Stamens fewer than the lobes of the corolla... z.

z. Carpels 1-2-seeded, separating as nutlets... a.

a. Herbage not aromatic; inflorescence spicate, long-peduncled; corolla purplish to white, the tube scarcely longer than the calyx ..... 83. VERBENACEAE

a. Herbage often aromatic; inflorescence various, if spicate, then subtended by foliaceous bracts; corolla-tube usually exserted ..... 84. LABIATAE

z. Carpels several-seeded, forming capsules... b.

b. Inflorescence axillary, of subsessile lavender-blue flowers; corolla large, funnelform, subequally 5-lobed; ovules and seeds borne on hooked projections..... 88. ACANTHACEAE

b. Inflorescence terminal, or if axillary, then flowers pedicelled or yellow; corolla small, or large and campanulate... 86. SCROPHULARIACEAE

y. Stamens the same number as or more numerous than the corolla-lobes... c.

c. Corolla bilateral, somewhat papilionaceous, white to pink or rose; stamens more numerous than corolla-lobes, united by their filaments ..... 50. POLYGALACEAE

c. Corolla radial, 4-12-lobed... d.

d. Ovaries two; plants often with abundant milky juice... e.

e. Corolla campanulate to tubular, greenish-white; stamens distinct; fruit of 2 slender cylindrical follicles..... 79. APOCYNACEAE

e. Corolla with a 5-10-lobed corona with or without ascending hoods; stamens monadelphous; fruit a lanceolate follicle ..... 80. ASCLEPIADACEAE

d. Ovary single... f.

f. Inflorescence axillary, of long-peduncled flowers; corolla yellow or scarlet; stamens opposite corolla-lobes..... 74. PRIMULACEAE

f. Inflorescence terminal, cymose; corolla

rose or white; stamens alternate with corolla-lobes... g.
g. Leaf-bases connected by a stipular line; flowers small, 4-merous; corolla white, funnelform; ovary 2-locular ..... 77. LOGANIACEAE
g. Leaves exstipulate; flowers 5-12-merous; corolla white to rose, rotate; ovary 1-locular..... 78. GENTIANACEAE

b. Leaves alternate, or cauline leaves absent... h.
h. Flowers with one floral envelope, or perianth absent (cyathium perhaps suggesting a calyx and corolla in Euphorbia of Euphorbiaceae)... i.
i. Flowers unisexual, clustered in spikes, or borne in a cup-like cyathium with petaloid appendages; fruit a 3-seeded capsule..... 51. EUPHORBIACEAE
i. Flowers perfect, or if unisexual, then plant dioecious... j
j. Leaves with cylindric stipules sheathing the stem; flowers individually small, aggregated into verticels or terminal clusters; fruit a triangular or lenticular achene..... 29. POLYGONACEAE
j. Leaves exstipulate; fruit a berry or utricle... k.
k. Inflorescence a loose raceme; sepals petaloid; ovary a ring of united carpels; fruit a subglobose juicy berry..... 32. PHYTOLACCACEAE
k. Inflorescence of compact spikes, fascicles or glomerules... l.
l. Plants ill-scented; flowers perfect, without scarious bracts, in dense glomerules on elongate spikes; calyx herbaceous..... 30. CHENOPODIACEAE
l. Plants not aromatic, dioecious; flowers subtended by scarious bracts; calyx scarious ..... 31. AMARANTHACEAE
h. Flowers with 2 floral envelopes, calyx and corolla... m.
m. Petals or petal-like parts distinct... n.
n. Ovary inferior... o.
o. Inflorescence a simple or compound umbel, or rarely of heads; flowers individually small, usually white; fruit composed of two 1-seeded mericarps; stems usually hollow; petioles dilated to a sheathing base ..... 70. UMBELLIFERAE
o. Inflorescence axillary, of solitary flowers, or a terminal raceme; fruit a capsule or indehiscent; stems solid; petioles not sheathing... 68. ONAGRACEAE
n. Ovary superior... p.
p. Leaves compound... q.
q. Petals 4, narrowed below into a claw; inflorescence racemose; flowers usually small, white or yellow; stamens usually 6; fruit a silique or a silicle..... 41. CRUCIFERAE
q. Petals 5; fruit not a silique or silicle... r.
r. Stamens numerous; corolla yellow; ovaries 2 or numerous; fruit an achene borne in a bristly hypanthium or on surface of a receptacle ..... 44. ROSACEAE

r. Stamens twice as many as corolla-lobes or fewer... s.
s. Plants erect or climbing by aerial rootlets; flowers white or greenish, in loose lateral drooping clusters; stamens 5; fruit a whitish drupe..... 52. ANACARDIACEAE
s. Plants never with aerial rootlets; flowers not in drooping clusters; stamens 10; fruit not a drupe... t.
t. Leaves stipulate; flowers papilionaceous or regular; ovary simple; fruit a legume ..... 45. LEGUMINOSAE
t. Leaves exstipulate, the leaflets obcordate; flowers regular; ovary compound; fruit a capsule..... 46. OXALIDACEAE

p. Leaves simple... u.
u. Flowers bilateral... v.
v. Flowers without spurs, white to pink or rose; petals 3; stamens 8, monadelphous; fruit a small capsule..... 50. POLYGALACEAE
v. Flowers spurred; stamens 5... w.
w. Leaves exstipulate; inflorescence axillary; flowers 3-merous; sepals unequal, the lower saccate; lateral petals lobed ..... 56. BALSAMINACEAE
w. Leaves stipulate; flowers axillary or scapose, 5-merous; sepals with posterior auricles; petals unequal, the lower spurred, the lateral usually bearded... 62. VIOLACEAE
u. Flowers radial or nearly so... x.
x. Petals 3, red; inflorescence paniculate, leafy; fruit a 3-valved capsule. (Lechea) ..... 61. CISTACEAE
x. Petals 4-12... y.
y. Stamens numerous, or if few, then ovaries numerous... z.
z. Petals yellow with basal nectariferous pits; ovaries numerous, simple; fruit an achene. (Ranunculus)... 36. RANUNCULACEAE
z. Petals white or pink; ovary 1, compound; fruit not an achene... a.
a. Plants from stout rhizomes with red juice; leaf 1, basal, palmately lobed; flower solitary, scapose; petals 8 or more; fruit a linear capsule (Sanguinaria)..... 40. PAPAVERACEAE
a. Plants with mucilaginous juice; leaves cauline; flowers axillary, pink or cream-colored; petals 5; fruit a subglobose capsule..... 59. MALVACEAE
y. Stamens twice as many as petals or less; petals 4 or 5...b.
b. Petals 4, narrowed below into a claw; inflorescence racemose; flowers usually

small, white or yellow; stamens usually 6; fruit a silique or silicle ..... 41. CRUCIFERAE

b. Petals 5... c.

c. Plants climbing by tendrils; leaves 3-lobed; flowers with a fringed corona; stamens monadelphous; fruit a berry ..... 63. PASSIFLORACEAE

c. Plants erect; corona absent; stamens distinct... d.

d. Leaves deeply cleft; inflorescence axillary; corolla roseate; carpels 5, prolonged into beaks and separating in fruit.... 47. GERANIACEAE

d. Leaves not cleft, evergreen, marked with white, or leaves scale-like and plant without chlorophyll; inflorescence terminal, 1-5-flowered; corolla white or pinkish; fruit a capsule..... 72. PYROLACEAE

m. Petals united into a gamopetalous corolla... e.

e. Ovary inferior, adnate to calyx-tube... f.

f. Plants climbing with tendrils; leaves 5-lobed; flowers unisexual, small; corolla campanulate, yellow; fruit a pepo, pulpy, many-seeded ..... 93. CUCURBITACEAE

f. Plants without tendrils; fruit an achene or a capsule... g.

g. Flowers aggregated on a common receptacle into an involucrate head; calyx-limb often modified into bristles or scales, never herbaceous; fruit an achene..... 95. COMPOSITAE

g. Flowers not aggregated into a head; calyx herbaceous; fruit a capsule... h.

h. Flowers campanulate; corolla white; ovary 2/3 inferior; stamens opposite corolla-lobes (Samolus)..... 74. PRIMULACEAE

h. Flowers regular and subrotate, or irregular and somewhat bilabiate; corolla blue or scarlet; ovary wholly inferior; stamens alternate with corolla-lobes. 94. CAMPANULACEAE

e. Ovary superior, free from calyx-tube... i.

i. Stamens more numerous than corolla-lobes... j.

j. Flowers bilateral... k.

k. Leaves stipulate; flowers papilionaceous or regular; petals 5; ovary simple; fruit a legume ..... 45. LEGUMINOSAE

k. Leaves exstipulate; flowers not papilionaceous; petals 3-4... l.

l. Leaves compound, finely dissected; sepals 2; corolla-lobes 4, red purple, the outer spurred at base; stamens 6; fruit globose, indehiscent. (Fumaria)..... 40. PAPAVERACEAE

l. Leaves simple, linear, entire; sepals 5;

corolla-lobes 3, white to pink or rose; stamens 8, monadelphous; fruit a capsule ..... 50. POLYGALACEAE

j. Flowers radial... m.

m. Stamens numerous, the filaments united into a tube surrounding the style; flowers axillary; corolla pink or cream-colored; fruit a large subglobose capsule..... 59. MALVACEAE

m. Stamens 10... n.

n. Leaves digitately compound, the 3 leaflets obcordate; flowers scapose or on axillary peduncles; corolla yellow or violet ..... 46. OXALIDACEAE

n. Leaves simple, leathery, pilose; flowers clustered, fragrant, each subtended by 2 bracts; corolla salverform, pink to white, pubescent within. (Epigaea)... 73. ERICACEAE

i. Stamens as numerous as or less numerous than lobes of the corolla... o.

o. Plants twining; parasitic with leaves scale-like and flowers small and whitish, or green and leafy with flowers large, funnelform and sky-blue ..... 81. CONVOLVULACEAE

o. Plants erect or decumbent, not twining... p.

p. Plants scapose; inflorescence spicate; flowers small, 4-merous, each subtended by a bract; corolla white, long-persistent; fruit a capsule ..... 89. PLANTAGINACEAE

p. Plants with cauline leaves; flowers 5-merous... q.

q. Ovaries 2, or if one, then deeply divided; fruit a follicle or nutlets... r.

r. Inflorescence umbellate; corolla bright orange with a corona of 5 ascending hoods; ovaries 2; stamens monadelphous; fruit a follicle. (Asclepias) ..... 80. ASCLEPIADACEAE

r. Inflorescence cymose; corolla white or pale blue, salverform to funnelform; ovary deeply 4-parted; stamens distinct; fruit of nutlets..... 82. BORAGINACEAE

q. Ovary one, undivided; fruit a capsule or a berry... s.

s. Fruit a many-seeded berry; corolla rotate; inflorescence axillary ..... 85. SOLANACEAE

s. Fruit a capsule; corolla bilabiate, or if rotate, then the inflorescence a terminal spike or raceme ..... 86. SCROPHULARIACEAE

TREATMENT OF FAMILIES

1. LYCOPODIACEAE

1. Lycopodium L. Club-moss.
   1. L. complanatum L. var. flabelliforme Fern. Ground-pine. Occasional; forming large colonies in pine woods. 118.

2. OPHIOGLOSSACEAE

a. Sterile blade dissected, its veins free; sporangia in a panicle ..... 1. Botrychium
a. Sterile blade simple, entire, its veins netted; sporangia in two rows in a simple slender spike..... 2. Ophioglossum

1. Botrychium Sw. Grape-fern.
   1. B. virginianum (L.) Sw. Rattlesnake-fern. Occasional; in mixed deciduous woods with extensive leaf litter; in pine woods. 685.

2. Ophioglossum L. Adder's-tongue.
   1. O. vulgatum L. var. pycnostichum Fern. Rare; in moist deciduous woods. 697.

3. OSMUNDACEAE

1. Osmunda L. Flowering fern.
   a. Sterile fronds bipinnate; fertile fronds similar, with fruiting panicle at summit..... 1. O. regalis
   a. Sterile fronds once-pinnate, fertile fronds dissimilar and separate from sterile, woolly, cinnamon-colored.. 2. O. cinnamomea

   1. O. regalis L. var. spectabilis (Willd.) Gray. Royal fern. Fairly common; at margins of brackish marshes. 195, 703.
   2. O. cinnamomea L. Cinnamon fern. Rare; one small colony in depression created by uprooted tree. 754.

4. POLYPODIACEAE

a. Fronds dimorphic... b.
   b. Leaflets of sterile frond sinuately lobed, not serrate; fertile frond not leaf-like; fertile segments bead-like with sori concealed..... 1. Onoclea
   b. Leaflets of sterile frond finely serrate; fertile fronds

once-pinnate; fertile segments linear..... 7. Woodwardia

a. Fronds not dimorphic... c.
  c. Sori marginal; rhizomes hairy, without scales... d.
    d. Sori linear, continuous, covered by the reflexed margin of leaf blade; frond coarse; plant not fragrant... 8. Pteridium
    d. Sori globular, borne in cup-like indusia at ends of veins; frond finely dissected, glandular-hairy; plant fragrant ..... 4. Dennstaedtia
  c. Sori intramarginal... e.
    e. Indusia orbicular to reniform... f.
      f. Indusium with a deep sinus or obscure or absent ..... 2. Dryopteris
      f. Indusium without a sinus, conspicuous..... 3. Polystichum
    e. Indusia linear or oblong... g.
      g. Veins anastomosing, with conspicuous areolae; sori parallel to midvein of leaflet..... 7. Woodwardia
      g. Veins free; sori oblique to midveins... h.
        h. Fronds subtripinnate; rachis pale, sparingly scaly or glandular..... 5. Athyrium
        h. Fronds once-pinnate, small; rachis lustrous, purple-blackish..... 6. Asplenium

1. Onoclea L. Sensitive fern.
  1. O. sensibilis L. Fairly common; in moist mixed deciduous woods and pine woods. 238, 602.

2. Dryopteris Adans. Shield-fern, wood-fern.
  a. Indusia absent; fronds deltoid..... 3. D. hexagonoptera
  a. Indusia present and conspicuous; fronds lanceolate... b.
    b. Fronds membranaceous, annual; slender stipe and cord-like rhizome not conspicuously scaly... c.
      c. Lower pinnae not reduced in size; lowest pinnae at most one-half length of median; lateral veins of sterile frond segments forking... ..... 1. D. thelypteris
      c. Lower pinnae gradually decreasing in size; lateral veins of sterile frond segments simple..... 2. D. noveboracensis
    b. Fronds firm, evergreen; stout stipe and rhizome scaly... d.
      d. Fronds tripinnate or tripinnatifid, 1-6.5 dm. long ..... 4. D. spinulosa
      d. Fronds bipinnate or bipinnatifid, 3-15 dm. long 5. D. celsa

  1. D. thelypteris (L.) Gray var. pubescens (Lawson) Nakai. Marsh-fern. Common; at margins of brackish marshes; forming beds in wet woods. 326, 603, 609.
  2. D. noveboracensis (L.) Gray. New York fern. Occasional; in moist woods. 575, 608.
  3. D. hexagonoptera (Michx.) Christens. Broad beech-fern. Rare; one colony in moist shady mixed woods. 709.
  4. D. spinulosa (O.F. Muell.) Walt. Fancy fern. Occasional; in pine woods. 613.
  5. D. celsa (Wm. Palmer) Small. Log-fern. Rare; one colony on moist bank above brackish marsh. 605.

3. Polystichum Roth.
   1. P. acrostichoides (Michx.) Schott. Christmas-fern. Abundant; in moist shady pine woods and mixed woods. 300, 449.

4. Dennstaedtia Bernh.
   1. D. punctilobula (Michx.) Moore. Hay-scented fern. Fairly common; in open dry mixed woods. 504, 607.

5. Athyrium Roth.
   1. A. filix-femina (L.) Roth. Lady-fern. Common; in moist woods and low ground near brackish marshes. 572, 600, 604.

6. Asplenium L. Spleenwort.
   1. A. platyneuron (L.) Oakes. Ebony spleenwort. Abundant; in moist pine woods and mixed woods. 25, 534.

7. Woodwardia Sm. Chain-fern.
   a. Fronds similar, bipinnatifid; veins forming one row of areolae ..... 1. W. virginica
   a. Fronds dimorphic, once-pinnatifid; veins forming many rows of areolae..... 2. W. areolata

   1. W. virginica (L.) Sm. Virginian chain-fern. Occasional; in moist shady woods. 794.
   2. W. areolata (L.) Moore. Netted chain-fern. Common; in moist woods. 568.

8. Pteridium Gleditsch. Bracken.
   1. P. aquilinum (L.) Kuhn var. latiusculum (Desv.) Underw. Brake. Occasional; in dry open woods. 345, 743.

5. SALVINIACEAE

1. Azolla Lam. Water-fern.
   1. A. caroliniana Willd. Rare; with Lemna minor and Spirodela polyrhiza in shallow, slightly brackish water at edge of marsh. 577, 582.

6. PINACEAE

   a. Leaves needle-like; cones woody... b.
      b. Leaves in fascicles of 2-5, evergreen; cones elongate. 1. Pinus
      b. Leaves borne singly, two-ranked, deciduous; cones globose ..... 2. Taxodium
   a. Leaves scale-like, or needle-like on young sprouts only; cones drupe-like..... 3. Juniperus

1. Pinus L. Pine.
   a. Leaves in groups of 2 or 3, 12-25 cm. long; cones 6-12 cm. long ..... 1. P. taeda
   a. Leaves in groups of 2, 4-8 cm. long; cones 4-6 cm. long ..... 2. P. virginiana

1. P. taeda L. Loblolly pine. Abundant; forming extensive stands in areas of later old-field succession. 97, 615.
2. P. virginiana Mill. Scrub pine. Occasional; sparsely mixed with stands of Pinus taeda. 610.

2. Taxodium Richard. Bald cypress.
1. T. distichum (L.) Richard. Common; at margins of brackish marshes and along sandy shores of the James River. 180, 403.

3. Juniperus L. Juniper.
1. J. virginiana L. Red cedar. Fairly common; understory tree in stands of Pinus taeda. 96, 204, 385.

7. TYPHACEAE

1. Typha L. Cat-tail.
a. Staminate and pistillate parts of spike usually contiguous; pale leaves 6-23 mm. wide; plants 1-2.7 m. high..... 1. T. latifolia
a. Staminate and pistillate parts of spike separated; leaves 3-8 mm. wide; plant 0.75-1.5 m. high..... 2. T. angustifolia

1. T. latifolia L. Common cat-tail. Occasional; in brackish marshes. 459.
2. T. angustifolia L. Abundant; extensive beds in brackish marshes. 34.

8. ALISMATACEAE

1. Sagittaria L. Arrowhead.
1. S. falcata Pursh. Occasional; in shallow water of brackish marshes. 141.

9. GRAMINEAE

(Key to tribes)

a. Spikelets 2-many-flowered (including staminate flowers)... b.
b. Spikelets pedicelled... c.
c. Glumes shorter than lowest fertile lemma... d.
d. Plants woody, culms perennial..... 1. Bambuseae
d. Plants herbaceous, culms annual..... 2. Festuceae
c. Glumes as long as or longer than the lowest fertile lemma..... 4. Aveneae
b. Spikelets sessile..... 3. Hordeae
a. Spikelets with one floret, either perfect or imperfect... e.
e. Glumes absent..... 8. Zizanieae
e. Glumes two, or rarely one... f.
f. Spikelets falling in groups... g.
g. Lemmas enclosed in a spiny bur. (Cenchrus)... 9. Paniceae
g. Lemmas not concealed in a bur..... 3. Hordeae
f. Spikelets individually articulated... h.
h. Articulation above the glumes... i.

i. Spikelets sessile..... 6. Chlorideae
i. Spikelets pedicelled... j.
j. Fertile lemma solitary..... 5. Agrostideae
j. Fertile lemma with two sterile and modified lemmas below..... 7. Phalarideae
h. Articulation below the glumes... k.
k. Spikelets without a sterile lemma below the fertile... l.
l. Spikelets sessile..... 6. Chlorideae
l. Spikelets pedicelled..... 5. Agrostideae
k. Spikelets with a sterile lemma below the fertile... m.
m. Some or all spikelets perfect... n.
n. Glumes and sterile lemma membranaceous; fertile lemma firm..... 9. Paniceae
n. Glumes firm; lemmas thin..... 10. Andropogoneae
m. All spikelets unisexual..... 11. Maydeae

Tribe 1. Bambuseae

1. Arundinaria Michx. Cane.
1. A. gigantea (Walt.) Chapm. Giant cane. Fairly common; in thickets along edges of brackish marshes and occasionally along roadsides. 70, 171.

Tribe 2. Festuceae

a. Lemmas three-nerved... b.
b. Spikelets densely bearded on the lemma or palea..... 9. Tricdia
b. Spikelets short-ciliate on the lemma or palea, not densely bearded..... 7. Eragrostis
a. Lemmas 5-several-nerved... c.
c. Lowest lemma sterile..... 8. Uniola
c. Lowest lemma fertile... d.
d. Spikelets subsessile in dense 1-sided clusters.. 6. Dactylis
d. Spikelets not in dense 1-sided clusters... e.
e. Lemmas keeled..... 5. Poa
e. Lemmas rounded... f.
f. Lemmas 2-toothed at apex, awned just below notch ..... 2. Bromus
f. Lemmas not 2-lobed at apex... g.
g. Plants perennial..... 3. Festuca
g. Plants annual..... 4. Vulpia

2. Bromus L. Brome-grass.
1. B. commutatus Schrad. Fairly common; along roadsides and in waste places. 784, 860.

3. Festuca L. Fescue-grass.
1. F. elatior L. Meadow-fescue. Along open roadsides. 808.

4. Vulpia K.C. Gmel.
1. V. myuros (L.) K.C. Gmel. Along open roadsides. 819, 857.

5. Poa L. Meadow grass.
a. Plants annual.....1. P. annua
a. Plants tufted or creeping perennials... b.

b. Culms flattened; plants blue-green in color, not tufted ..... 2. P. compressa
b. Culms not strongly flattened; plants green, tufted ..... 3. P. pratensis

1. P. annua L. Low speargrass, annual bluegrass. Along open roadsides; in waste places. 646, 722.
2. P. compressa L. Canada bluegrass. In old roadbed; in waste places. 846.
3. P. pratensis L. Kentucky bluegrass. Along open roadsides; in open woods. 742, 811.

6. Dactylis L. Orchard-grass.
1. D. glomerata L. Fairly common; along open roadsides; in mowed weedy area; in waste places. 797, 814.

7. Eragrostis Beauv. Love-grass.
1. E. spectabilis (Pursh) Steud. Tumble grass. In open, seldom mowed field. 381.

8. Uniola L. Spikegrass.
1. U. laxa (L.) BSP. Along open roadsides. 228.

9. Triodia R.Br.
1. T. flava (L.) Smyth. Tall red-top. Along open roadsides. 235, 278.

Tribe 3. Hordeae

a. Spikelets solitary at each joint of the rachis..... 10. Lolium
a. Spikelets more than one at each joint of the rachis... b.
b. Spikelets three at each joint of the rachis, the central spikelet 1-flowered, the lateral pedicelled, sterile 11. Hordeum
b. Spikelets two at each joint of the rachis, each 2-6-flowered..... 12. Elymus

10. Lolium L. Darnel.
1. L. perenne L. var. perenne. Common darnel, perennial rye-grass. Along open roadsides. 804.

11. Hordeum L. Barley.
1. H. pusillum Nutt. Little barley. Along open roadsides; at edges of mowed lawn. 773, 807.

12. Elymus L. Wild-rye.
1. E. virginicus L. Terrell grass. In dry mowed field; along open roadsides; in dry open pine stand. 75, 177, 272.

Tribe 4. Aveneae

a. Spikelets with two florets, one perfect and one staminate; foliage soft-pubescent.....13. Holcus
a. Spikelets with two or more perfect florets... b.
b. Lemmas obtuse, awnless..... 14. Sphenopholis
b. Lemmas awned... c.
c. Lemma awned from the back with a short straight awn 15. Aira

c. Lemma awned from between two teeth, the awn flattened and twisted..... 16. Danthonia

13. Holcus L.
1. H. lanatus L. Velvet grass. Along open roadsides. 12, 813.

14. Sphenopholis Scribn.
1. S. obtusata (Michx.) Scribn. Prairie wedgegrass. In disturbed area adjacent to road. 805.

15. Aira L. Hairgrass.
1. A. elegans Willd. In open dry frequently mowed area. 873.

16. Danthonia DC. Wild oat-grass.
1. D. spicata (L.) Beauv. var. spicata. Poverty grass, white oat-grass. Along open dry gravelly roadsides. 802, 858.

Tribe 5. Agrostideae

a. Articulation above the glumes; palea absent..... 17. Agrostis
a. Articulation below the glumes; palea present..... 18. Cinna

17. Agrostis L. Bentgrass.
a. Panicle very diffuse; spinulose-scabrous branches branching beyond the middle..... 1. A. hyemalis
a. Panicle not diffuse; glabrous or slightly scabrous branches branching at or below the middle..... 2. A. perennans

1. A. hyemalis (Walt.) BSP. Ticklegrass, hairgrass. Along open roadsides and in waste places. 806.
2. A. perennans (Walt.) Tuckerm. Upland bent. In shaded open-floored pine woods. 389.

18. Cinna L. Wood reedgrass.
1. C. arundinacea L. Stout woodreed. In shaded open-floored pine woods. 391.

Tribe 6. Chlorideae

a. Plants of aquatic habitats; spikelets articulated below the glumes..... 19. Spartina
a. Plants of weedy places; spikelets articulated above the glumes ..... 20. Cynodon

19. Spartina Schreb. Cord-grass, marsh-grass.
a. Leaves 1-2.5 cm. wide, their margins harshly scabrous; rhizomes hard, 1-2 cm. thick..... 1. S. cynosuroides
a. Leaves 0.4-1.5 cm. wide, smooth, succulent; rhizomes flaccid ..... 2. S. alterniflora

1. S. cynosuroides (L.) Roth. Salt reed-grass. Abundant; one of the dominant grasses of brackish marshes. 343.
2. S. alterniflora Loisel. Salt-water cord-grass. In brackish marshes; at sandy shores of the James River. 526, 590.

20. Cynodon Richard. Bermuda grass, scutch-grass.
    1. C. dactylon (L.) Pers. In open frequently mowed lawn. 871.

Tribe 7. Phalarideae

21. Anthoxanthum L. Sweet vernal grass.
    1. A. odoratum L. In open frequently mowed lawn; along grassy roadsides. 636, 718.

Tribe 8. Zizanieae

22. Zizania L. Wild rice, water-oats.
    1. Z. aquatica L. In open shallow water of brackish marshes. 611.

Tribe 9. Paniceae

a. Spikelets subtended by an involucre of distinct or fused bristles... b.
   b. Involucre of slender flexible bristles..... 27. Setaria
   b. Involucre a subglobose bur, with stiff retrorsely barbed bristles..... 28. Cenchrus
a. Spikelets without an involucre... c.
   c. Glume(s) or sterile lemma awned..... 26. Echinochloa
   c. Glumes and sterile lemmas awnless... d.
      d. Spikelets plano-convex, subsessile in spike-like racemes ..... 23. Paspalum
      d. Spikelets biconvex, in slender racemes or panicles... e.
         e. Second glume inflated and saccate at base, eleven-nerved..... 25. Sacciolepis
         e. Second glume not inflated at base, 3-9-nerved 24. Panicum

23. Paspalum L.
a. Spikelets rounded at summit, glabrous..... 1. P. floridanum
a. Spikelets acuminate, their margins long-villous... 2. P. dilatatum

1. P. floridanum Michx. At margins of open mowed field near standing water. 380.
2. P. dilatatum Poir. Dallis-grass. Along dry open roadsides; along grassy waysides. 91, 233, 452.

24. Panicum L. Panic-grass.
a. Basal leaves and culm leaves similar and elongate; winter rosette not formed... b.
   b. Culms terete, rigid, strongly whitened; spikelets 5-6.5 mm. long..... 1. P. amarum
   b. Culms compressed, stout, not whitened; spikelets 3-4 mm. long..... 2. P. anceps
a. Basal leaves different in shape from those of culm; winter rosette formed... c.
   c. Ligule manifest, a zone of hairs 3-5 mm. long 6. P. lanuginosum
   c. Ligule rudimentary, or zone of hairs less than 2 mm. long... d.
      d. Principal culm blades cordate at base... e.
         e. Spikelets 2.5-3 mm. long, ellipsoid-obovoid ..... 10. P. clandestinum
         e. Spikelets 1.3-1.7 mm. long, spherical... f.
            f. Culms spreading, nodes glabrous... 7. P. sphaerocarpon
            f. Culms erect, nodes pubescent..... 8. P. polyanthes

d. Principal culm blades rounded or narrowed at base... g.
g. Culms (except nodes) glabrous... h.
h. Spikelets 1.5-1.6 mm. long, glabrous (rarely puberulent)..... 4. P. microcarpon
h. Spikelets 1.8-2 mm. long, pubescent..... 5. P. nitidum
g. Culms pubescent... i.
i. Sheaths retrorsely pilose; blades thin, soft ..... 3. P. laxiflorum
i. Sheaths not retrorsely pilose, viscid at summit ..... 9. P. scoparium

1. P. amarum Ell. In open sandy field with Opuntia humifusa, above James River. 382.
2. P. anceps Michx. Along roadsides. 224.
3. P. laxiflorum Lam. In open-floored pine woods. 532.
4. P. microcarpon Muhl. Along roadside banks with pine litter. 11.
5. P. nitidum Lam. In moist open-floored pine woods. 304.
6. P. lanuginosum Ell. In gravel along open dry roadsides. 818, 856.
7. P. sphaerocarpon Ell. Along dry open roadsides. 227, 855.
8. P. polyanthes Schultes. At edge of woods bordering roadsides. 284.
9. P. scoparium Lam. Bordering roadsides, on grassy banks at edge of woods. 146, 266.
10. P. clandestinum L. In moist open-floored pine woods. 301.

25. Sacciolepis Nash.
1. S. striata (L.) Nash. Along sandy shores of James River bordering brackish marshes. 492.

26. Echinochloa Beauv.
a. Second glume awnless; spikelets with pustular-based trichomes ..... 1. E. pungens
a. Second glume awned; spikelets with trichomes not pustular-based; sterile lemma with awn 1-2.5 cm. long..... 2. E. walteri

1. E. pungens (Poir.) Rydb. var. pungens. At margin of brackish marshes. 411.
2. E. walteri (Pursh) Nash. At margin of brackish marshes; in shallow water along sandy shores of the James River. 331, 468.

27. Setaria Beauv. Bristly foxtail.
a. Each spikelet subtended by 5-20 bristles; panicle yellowish ..... 1. S. glauca
a. Each spikelet subtended by 1-3 green to purplish bristles ..... 2. S. viridis

1. S. glauca (L.) Beauv. Foxtail, pigeon-grass. Along dry open roadsides. 81, 230.
2. S. viridis (L.) Beauv. Green foxtail, bottle-grass. Along dry open roadsides. 225.

28. Cenchrus L. Sandbur, burgrass.
    1. C. tribuloides L. Sand-spur. Occasional; along low dunes above shores of James River. 418.

Tribe 10. Andropogoneae

a. Spikelets uniform, perfect, in pairs along rachis... 29. Erianthus
a. Spikelets dimorphic, one sessile and perfect, the other(s) imperfect or rudimentary... b.
   b. Decumbent annual; leaf-blades ovate, cordate..... 30. Arthraxon
   b. Erect perennial; leaf-blades linear, sessile.... 31. Andropogon

29. Erianthus Michx. Woolly beardgrass.
    1. E. giganteus (Walt.) Muhl. In low marshy ground. 456, 458, 525.

30. Arthraxon Beauv.
    1. A. hispidus (Thunb.) Makino var. cryptatherus (Hack.) Houda. In open grassy places; in weedy clearings in pine woods. 429.

31. Andropogon L. Beardgrass.
a. Racemes single at the summit of each peduncle..... 1. A. scoparius
a. Racemes two or more at the summit of each peduncle ..... 2. A. virginicus

    1. A. scoparius Michx. Broom-beardgrass, broom. In open fields, at edge of waste area bordering woods. 481.
    2. A. virginicus L. Broom-sedge. In open fields. 892.

Tribe 11. Maydeae

32. Tripsacum L. Gama-grass, sesame-grass.
    1. T. dactyloides L. In sandy soil above rocks at edge of James River. 72, 398.

10. CYPERACEAE

a. Achene enclosed in a membranaceous sac (perigynium)..... 5. Carex
a. Achene not enclosed in a perigynium... b.
   b. Spikelets flattened, in a spike; scales distichous.. 1. Cyperus
   b. Spikelets terete; scales spirally imbricated... c.
      c. Achenes tuberculate... d.
         d. Spikelet solitary and terminal; bristles absent ..... 2. Eleocharis
         d. Spikelets clustered; perianth of bristles ..... 4. Rhynchospora
      c. Achenes not tuberculate; perianth of bristles.... 3. Scirpus

1. Cyperus L. Galingale, umbrella-sedge.
a. Spikelets at maturity strongly reflexed; scales lanceolate .....1. C. dipsaciformis
a. Spikelets (except basal) spreading to ascending; scales elliptic-oblong to ovate... b.
   b. Spikes dense and compact; scales closely overlapping, with appressed tips... c.

c. Spikes globose, lowest flowering scale 3.5-4.2 mm. long ..... 3. C. ovularis
c. Spikes cylindric; lowest flowering scale 2-2.5 mm. long ..... 4. C. retrorsus
b. Spikes more open; scales with free tips..... 3. C. grayii

1. C. dipsaciformis Fern. Along dry open roadsides. 63.
2. C. grayii Torr. On sandy bank with Opuntia humifusa. 396.
3. C. ovularis (Michx.) Torr. In wet clay near road edge. 21.
4. C. retrorsus Chapm. In open sandy clearing in disturbed area. 184.

2. Eleocharis R.Br. Spike-rush.
a. Plants annual; tubercle flat, fitting closely to achene summit; scales obtuse.....1. E. engelmanni
a. Plant perennial; tubercle conic, constricted above achene summit; scales acute..... 2. E. ambigens

1. E. engelmanni Steud. In mud of sunken area with standing water, at road's edge. 820.
2. E. ambigens Fern. In brackish marshes and on sandy shores of the James River. 48, 822, 844, 868.

3. Scirpus L. Bulrush.
a. Involucral bract appearing to be a continuation of the culm... b.
b. Spikelets sessile, in a single glomerule; culm angled ..... 1. S. americanus
b. Spikelets in a branched cluster; culm terete..... 2. S. validus
a. Involucral bracts foliaceous, two or more, spreading... c.
c. Spikelets 1.3-3 cm. long; scales pubescent, awned; bristles weak..... 3. S. robustus
c. Spikelets 3-6 mm. long; scales glabrous; bristles long and curling..... 4. S. rubricosus

1. S. americanus Pers. Three-square, sword-grass. Common; in brackish marshes and along sandy shores of the James River at the low tide line. 49, 821, 864.
2. S. validus Vahl var. creber Fern. Great bulrush, soft-stem bulrush. In standing water of brackish marshes. 43.
3. S. robustus Pursh. In standing water of brackish marshes. 149.
4. S. rubricosus Fern. In wet low ground of brackish marshes. 274, 457.

4. Rhynchospora Vahl. Beak-rush.
1. R. corniculata (Lam.) Gray. Horned-rush. Occasional; in low marshy areas. 524.

5. Carex L. Sedge.
a. Spikelets mostly uniform and sessile... b.
b. Some or all spikes with terminal staminate flowers... c.
c. Inflorescence simple; spikes 3-9, single at each node of rachis..... 1. C. retroflexa
c. Inflorescence compound, at least lowest node branched... d.

d. Perigynia narrowly ovate with beak as long as body, 1-1.8 mm. broad..... 2. C. vulpinoidea
d. Perigynia broader, abruptly short-beaked, 1.6-2.4 mm. broad..... 3. C. annectens

b. Some or all spikes with terminal pistillate flowers... e.
e. Pistillate scales as long as perigynia, not awn-tipped. ..... 4. C. longii
e. Pistillate scales shorter than perigynia, awn-tipped ..... 5. C. alata

a. Spikelets dissimilar, some entirely pistillate, others staminate or mixed... f.
f. Perigynia beaked, their teeth stiff, sharp... g.
g. Pistillate spikes globose; perigynia 1.2-2 cm. long ..... 13. C. gravii
g. Pistillate spikes cylindric; perigynia less than 1 cm. long... h.
h. Perigynia obovoid, truncately contracted into the beak; uppermost spike mostly pistillate..... 9. C. typhina
h. Perigynia ovoid to lanceolate, gradually tapering into the beak; uppermost spike staminate... i.
i. Perigynia coriaceous; staminate spikes 2-4 ..... 10. C. lacustris
i. Perigynia membranaceous, staminate spike one... j.
j. Perigynia finely ribbed, reflexed in maturity ..... 11. C. comosa
j. Perigynia coarsely ribbed, widely ascending ..... 12. C. lurida

f. Perigynia beakless... k.
k. Terminal spike entirely staminate..... 8. C. blanda
k. Terminal spike pistillate except at base... l.
l. Perigynia glabrous; foliage glabrous.... 6. C. complanata
l. Perigynia pubescent; foliage pubescent..... 7. C. swanii

1. C. retroflexa Muhl. In dry soil of open grassy area cleared at edge of woods. 815.
2. C. vulpinoidea Michx. In moist ground at margin of brackish marshes. 840.
3. C. annectens Bickn. In open dry ground bordering roadsides. 810.
4. C. longii Mackenz. In moist soil of roadside gully with pine litter. 812.
5. C. alata T.& G. In brackish marshes; in moist roadside gullies. 53, 825, 842.
6. C. complanata Torr.& Hook. In open dry ground of roadside banks. 801, 823.
7. C. swanii (Fern.) Mackenz. In dry soil of roadside bank. 824.
8. C. blanda Dew. In shady densely grassy area near roadside. 887.
9. C. typhina Michx. In shallow standing water of low wooded area. 552.
10. C. lacustris Willd. In wet ground at margins of brackish marshes. 668, 897.
11. C. comosa Boott. At margins of brackish marshes. 841.
12. C. lurida Wahlenb. In wet ground on low bank of pond. 248.

13. C. gravii Carey var. hispidula Gray. In shady woods above rocks bordering James River. 786.

11. ARACEAE

a. Leaves compound; flowers covering only the base of the spadix ..... 1. Arisaema
a. Leaves simple; flowers covering nearly entire spadix. 2. Peltandra

1. Arisaema Mart. Indian-turnip.
   1. A. triphyllum (L.) Schott. Small jack-in-the-pulpit. Rare; one colony in damp depression of deciduous woods. 698.

2. Peltandra Raf. Arrow-arum.
   1. P. virginica (L.) Schott & Endl. Tuckahoe. Abundant; in mud and shallow water of low ground and brackish marshes. 196, 902.

12. LEMNACEAE

a. Frond with one or more rootlets... b.
   b. Frond with 6-18 rootlets, 5-11-nerved..... 1. Spirodela
   b. Frond with a single rootlet, 3-nerved..... 2. Lemna
a. Frond without rootlets... ..... 3. Wolffia

1. Spirodela Schleid.
   1. S. polyrhiza (L.) Schleid. Greater duckweed, water-flaxseed. Fairly common; on surface of still water of inlets and brackish marshes. 576, 762.

2. Lemna L. Duckweed, duck's-meat.
   1. L. minor L. Lesser duckweed. Abundant; on surface of still water of inlets and brackish marshes. 583.

3. Wolffia Horkel. Water-meal.
   1. W. papulifera C.H. Thompson. Occasional; on surface of still water of low swampy areas. 843.

13. COMMELINACEAE

a. Inflorescence borne in spathiform bracts; two petals larger than the third..... 1. Commelina
a. Inflorescence not borne in spathiform bracts; flowers regular ..... 2. Aneilema

1. Commelina L. Dayflower.
   1. C. communis L. Occasional; in weedy areas, of bank above marsh and of old roadbed. 424, 508.

2. Aneilema R.Br.
   1. A. keisak Hassk. Rare; in low soggy ground bordering brackish

marsh. 466.

14. PONTEDERIACEAE

1. Pontederia L. Pickerelweed.
   1. P. cordata L. Fairly common; in brackish marshes, especially at muddy sides of inlets. 139.

15. JUNCACEAE

a. Plants glabrous; capsule many-seeded..... 1. Juncus
a. Plants pubescent; capsule three-seeded..... 2. Luzula

1. Juncus L. Rush, bog-rush.
   a. Individual flowers prophyllate... b.
      b. Sheaths at base of scape bladeless, terminated by a mucro; inflorescence lateral..... 4. J. effusus
      b. Sheaths at base of scape bearing blades... c.
         c. Plants annual; leaf sheaths without auricles. 1. J. bufonius
         c. Plants perennial; leaf sheaths auricled... d.
            d. Leaf-blades flat; inflorescence appearing terminal ..... 2. J. tenuis
            d. Leaf-blades terete; inflorescence appearing lateral ..... 3. J. coriaceus
   a. Individual flowers eprophyllate... e.
      e. Leaf-blades flat, grasslike; 2-several-flowered heads 30-200 ..... 5. J. biflorus
      e. Leaf-blades hollow, cross-septate; hemispheric heads 5-20 ..... 6. J. acuminatus

   1. J. bufonius L. Toad-rush. In damp sand behind high water line sedges. 867.
   2. J. tenuis Willd. var. tenuis. Path-rush. Abundant; in dry soil along open roadsides. 29, 61, 779.
   3. J. coriaceus Mackenz. In wet soil of grassy roadside gully. 285.
   4. J. effusus L. Soft-rush. In moist soil of brackish marshes. 52.
   5. J. biflorus Ell. In moist low ground of depression in open pine stand; at margin of brackish marshes. 68, 262.
   6. J. acuminatus Michx. In wet soil of open grassy, often flooded area. 799.

2. Luzula DC. Woodrush.
   1. L. bulbosa (Wood) Rydb. Fairly common; in open ground; in clearings of mixed woods. 631, 649, 701.

16. LILIACEAE

a. Flowers or inflorescences axillary... b.

b. Leaves reduced to scales; ultimate branches filiform ..... 5. Asparagus
b. Leaves broad, flat... c.
c. Plants herbaceous; leaves sessile; flowers 1-few, drooping from axils..... 6. Polygonatum
c. Plants woody; leaves petioled; flowers in ascending umbels..... 7. Smilax
a. Inflorescence terminal... d.
d. Inflorescence umbellate... e.
e. Herbage with an onion odor; petals less than 1 cm. long, or flowers absent..... 1. Allium
e. Herbage without an onion odor; petals 1 cm. or more long ..... 2. Nothoscordum
d. Inflorescence corymbose or paniculate... f.
f. Stems rising from a bulb; leaves deciduous, linear ..... 3. Ornithogalum
f. Stems rising from a woody caudex; leaves evergreen, rigid, sword-like..... 4. Yucca

1. Allium L. Onion, garlic, leek.
a. Leaves flaccid, flattish, subbasal; spathe of three broad valves; outer bulb-coat fibrous..... 1. A. canadense
a. Leaves cylindric, hollow, extending halfway up the scape; spathe of one bract; outer bulb-coat membranaceous..... 2. A. vineale

1. A. canadense L. Wild garlic. Fairly common; in low weedy areas, at roadsides and in clearings in woods. 859, 877.
2. A. vineale L. Field-garlic. Common; in dry weedy areas; along roadsides. 13, 23, 58.

2. Nothoscordum Kunth. False garlic.
1. N. bivalve (L.) Britt. Common; along weedy roadsides; in clearings of woods; along sheltered sandy shores of Back River. 339, 513, 700.

3. Ornithogalum L. Star-of-Bethlehem.
1. O. umbellatum L. Nap-at-noon. Occasional; in waste places in disturbed woods; in seldom mowed field. 756.

4. Yucca L. Beargrass, spanish-bayonet.
1. Y. filamentosa L. Silkgrass, spoonleaf-yucca. Occasional; scattered in dry pine woods and near roadsides. 164.

5. Asparagus L. Asparagus.
1. A. officinalis L. Garden asparagus. Common; along roadsides; at margins of brackish marshes; in weedy clearings of woods; along sandy shores. 55.

6. Polygonatum Mill. Solomon's-seal.
1. P. biflorum (Walt.) Ell. Rare; in open-floored areas of rich deciduous woods. 796.

7. Smilax L. Greenbriar, catbriar.
a. Peduncles shorter than or equalling petiole of subtending leaf;

drupes mostly 2-seeded..... 1. S. rotundifolia
a. Peduncles distinctly shorter than petiole of subtending leaf; drupes mostly 1-seeded... b.
b. Prickles hard and rigid; leaves often bristly-ciliate, with thickened margins; seed 4-4.8 mm. long..... 2. S. bona-nox
b. Prickles weak, bristle-like; leaves eciliate, with thin margins; seed 5-6.5 mm. long..... 3. S. tamnoides

1. S. rotundifolia L. Common greenbriar, horsebriar. Common; climbing in moist areas of mixed woods. 167, 444.
2. S. bona-nox L. Abundant; forming tangles in waste areas and in dry mixed woods. 234, 365, 388.
3. S. tamnoides L. China-root, Hellfetter. Occasional; in low ground at margin of brackish marshes. 612.

17. DIOSCOREACEAE

1. Dioscorea L. Yam.
   1. D. quaternata (Walt.) J.F. Gmel. Rare; in rich mixed woods. 912.

18. AMARYLLIDACEAE

a. Flowers usually several; perianth pubescent on outside; base a corm..... 3. Hypoxis
a. Flowers solitary; perianth glabrous; base a bulb... b.
b. Flowers with a conspicuous corona, yellow, nodding 1. Narcissus
b. Flowers without a corona, white or pinkish, erect. ..... 2. Zephyranthes

1. Narcissus L. Narcissus.
   1. N. pseudo-narcissus L. Daffodil. Rare; persistent at vicinity of old home site. 619.

2. Zephyranthes Herb. Zephyr-lily.
   1. Z. atamasco (L.) Herb. Atamasco-lily, Jamestown-lily. Fairly common; in low ground of meadows, of moist woods and at margins of brackish marshes. 749.

3. Hypoxis L. Stargrass.
   1. H. hirsuta (L.) Coville. Yellow stargrass. Common; in dry soil of open woods and of grassy waysides. 65, 77, 80.

19. IRIDACEAE

a. Flowers less than 2 cm. long, regular; style branches filiform; stem winged..... 1. Sisyrinchium
a. Flowers greater than 3 cm. long, with dissimilar sepals and petals; style branches petaloid; stem terete..... 2. Iris

1. Sisyrinchium L. Blue-eyed grass.
   1. S. angustifolium Mill. Fairly common; in open woods; along grassy roadsides. 26, 737.

2. Iris L. Iris, Fleur-de-lis.
   a. Plant slender; leaves 2-5 mm. wide; capsule sharply angled ..... 1. I. prismatica
   a. Plant stout; leaves 5-30 mm. wide; capsule obtusely angled ..... 2. I. virginica

   1. I. prismatica Pursh. Slender blue flag. Rare; in low ground at edge of field. 781.
   2. I. virginica L. Southern blue flag. Occasional; in wet soil of brackish marshes and of low swampy areas with standing water. 738, 845.

20. ORCHIDACEAE

   a. Lip a showy inflated pouch 3.5-7 cm. long; fertile anthers 2 ..... 1. Cypripedium
   a. Lip concave or flat; fertile anther solitary... b.
      b. Flowers with a distinct spur; spurs at least 5 mm. long... c.
         c. Leaves present at the time of flowering; flowers orange-yellow; lip simple, deeply fringed..... 2. Habenaria
         c. Leaves absent at the time of flowering; flowers greenish; lip three-lobed..... 3. Tipularia
      b. Flowers without a conspicuous spur... d.
         d. Leaves chiefly in a basal rosette or paired at the base.. e.
            e. Leaves two, ascending; flowers in a raceme, greenish ..... 7. Liparis
            e. Leaves in a basal rosette, spreading; flowers in a spike, yellowish-white... f.
               f. Leaves extending up the stem, membranaceous; lip spreading..... 3. Spiranthes
               f. Leaves all basal, evergreen, with a network of white veins; lip globose-saccate..... 4. Goodyera
         d. Leaves all cauline... g.
            g. Leaves a single pair, sessile near the middle of the stem; lip deeply cleft; stem from fibrous roots ..... 5. Listera
            g. Leaf usually solitary; lip two-lobed at summit; stem from solid tuber..... 6. Malaxis

1. Cypripedium L. Lady's-slipper, moccasin-flower.
   1. C. acaule Ait. Stemless lady's-slipper, pink lady's-slipper. Occasional; in open-floored pine woods. 728.

2. Habenaria Willd. Fringed orchis.
   1. H. cristata (Michx.) R.Br. Crested yellow orchis. Rare; in open pine woods bordering roadside. 213.

3. Spiranthes Richard. Ladies'-tresses, pearl-twist.
   1. S. odorata (Nutt.) Lindl. Marsh ladies'-tresses. Rare; in wet

soil at margin of brackish marshes. 510.

4. Goodyera R.Br. Rattlesnake-plantain.
   1. G. pubescens (Willd.) R.Br. Downy rattlesnake-plantain. Occasional; in moist pine woods. 191, 315.

5. Listera R.Br. Twayblade.
   1. L. australis Lindl. Southern twayblade. Rare; one colony in moist soil of low area of deciduous woods. 653.

6. Malaxis Sw. Malaxis, adder's-mouth.
   1. M. unifolia Michx. Green adder's-mouth. Rare; in damp pine woods. 314.

7. Liparis Richard. Twayblade.
   1. L. lilifolia (L.) Richard. Lilia-leaved twayblade. Fairly common; in damp soil of pine woods; in weedy-floored pine woods. 780.

8. Tipularia Nutt. Cranefly orchis.
   1. T. discolor (Pursh) Nutt. Occasional; in damp soil of pine woods and deciduous woods. 306, 312.

21. SALICACEAE

1. Salix L. Willow, osier.
   1. S. nigra Marsh. Black willow. In wet ground bordering marshes. 101, 464, 778.

22. MYRICACEAE

1. Myrica L.
   1. M. cerifera L. Wax-myrtle, candleberry. Abundant; in and along brackish marshes; along roadsides; in pine woods. 292.

23. JUGLANDACEAE

a. Pith of twigs chambered; fruit with indehiscent husk; staminate aments solitary..... 1. Juglans
a. Pith of twigs not chambered; husk of fruit splitting into valves; staminate aments in clusters..... 2. Carya

1. Juglans L. Walnut.
   1. J. nigra L. Black walnut. Occasional; in deciduous woods. 114, 909.

2. Carya Nutt. Hickory.
   a. Leaflets 9-17, lower falcate; fruit elongate with narrowly winged sutures.....1. C. illinoensis
   a. Leaflets 5-9; fruit scarcely keeled... b.
   b. Young branchlets, petioles, rachises and lower leaf surfaces

tomentose with curly fascicled hairs; fruit 3.5-5 cm. long, its husk 3-4 mm. thick..... 2. C. tomentosa
b. Young branchlets, petioles and rachises glabrous; leaves pilose on nerves beneath; fruit 1.5-3.5 cm. long, its husk 1.5-2.5 mm. thick..... 3. C. glabra

1. C. illinoensis (Wang.) K.Koch. Pecan. Fairly common; persistent in vicinity of old home sites. 92, 176, 437, 544.
2. C. tomentosa Nutt. Mockernut, white-heart hickory. Fairly common; in rich deciduous woods. 499, 502.
3. C. glabra (Mill.) Sweet. Pignut. Common; in rich deciduous woods. 498, 574.

24. CORYLACEAE

a. Tree with close gray bark; pistillate aments elongate, loose ..... 1. Carpinus
a. Shrub, branching from the base; pistillate aments short, 1-1.5 cm. long, sessile, persistent..... 2. Alnus

1. Carpinus L. Hornbeam, ironwood.
1. C. caroliniana Walt. American hornbeam, blue-beech. Rare; in low rich mixed woods. 692.

2. Alnus B.Ehrb. Alder.
1. A. serrulata (Ait.) Willd. Common alder. Rare; on sandy bank above shores of the James River. 880.

25. FAGACEAE

a. Nuts sharply triangular; involucre of pistillate flower 2-4-valved, prickly..... 1. Fagus
a. Nuts rounded; involucre of pistillate flower a cupule of prickleless imbricated scales..... 2. Quercus

1. Fagus L. Beech.
1. F. grandifolia Ehrh. Rare; single tree in woods of Civil War fort site; probably a planting. 777.

2. Quercus L. Oak.
a. Bark pale; lobes of leaves rounded, not bristle-tipped... b.
b. Mature leaves light green and glabrous beneath; nut 1.5-2.5 cm. long.....1. Q. alba
b. Mature leaves brownish-downy beneath with some stellate hairs; nut 1-1.5 cm. long..... 2. Q. stellata
a. Bark darker; leaves entire or with acute, bristle-tipped lobes.. c
c. Leaves pinnately lobed... d.
d. Mature leaves glabrous or pubescent only in axils of veins beneath... e.
e. Terminal buds ovoid, 3-5 mm. long; acorn cups 1-1.5 cm. broad..... 3. Q. palustris
e. Terminal buds 4-angled, pubescent, 7-10 mm. long;

acorn cups 2-2.5 cm. broad..... 4. Q. velutina
d. Mature leaves pubescent beneath... f.
f. Leaves grayish-tomentose beneath with elongate terminal lobes; lateral lobes falcate; acorn cup shallow, 1.2-1.6 cm. broad..... 5. Q. falcata
f. Leaves fulvous-pubescent beneath with conspicuous stellate hairs; acorn cup turbinate, 2-2.5 cm. broad ..... 4. Q. velutina
c. Leaves entire or somewhat 3-5-lobed at summit... g.
g. Leaves broadly obovate, scurfy pubescent beneath ..... 6. Q. marilandica
g. Leaves not broadly obovate, broadest near middle, glabrate or with axillary tufts of hair... h.
h. Leaves dull beneath, 2-5 cm. wide; acorn cup 15-20 mm. broad..... 7. Q. laurifolia
h. Leaves glossy beneath, 0.7-3 cm. wide; acorn cup 9-12 mm. broad..... 8. Q. phellos

1. Q. alba L. White oak. Fairly common; in mixed deciduous woods. 484, 516.
2. Q. stellata Wang. Post-oak. Fairly common; in mixed deciduous woods. 336, 369, 512.
3. Q. palustris Muenchh. Pin-oak, Spanish oak. Occasional; in moist soil near marshes. 475.
4. Q. velutina Lam. Black oak. Fairly common; in mixed deciduous woods. 448, 831.
5. Q. falcata Michx. Spanish oak, southern red oak.
var. falcata. Leaves with 1-2(-3) pairs irregular, often falcate lateral lobes; base of blade rounded. Common; in mixed deciduous woods. 471, 518, 541.
var. pagodaefolia Ell. Leaves with (2-)3-5 pairs subequal, scarcely falcate lateral lobes; base of blade cuneate, seldom rounded. Common; in mixed deciduous woods. 220, 489, 517, 551.
6. Q. marilandica Muenchh. Black jack oak. Occasional; in mixed deciduous woods. 830.
7. Q. laurifolia Michx. Laurel-leaved oak. Occasional; in moist soil of low areas of woods bordering marshes. 585, 739.
8. Q. phellos L. Willow oak. Fairly common; in moist soil of low areas of mixed woods bordering marshes. 371, 515.

26. ULMACEAE

a. Fruit a samara; leaves with several prominent parallel veins ..... 1. Ulmus
a. Fruit a drupe; leaves prominently 3-veined at base..... 2. Celtis

1. Ulmus L. Elm.
a. Samaras subsessile, orbicular, eciliate; leaves 10-20 cm. long, harshly scabrous above..... 1. U. rubra
a. Samaras pedicelled, elliptic or ovate, ciliate; leaves glabrous or somewhat scabrous above... b.
b. Samaras glabrous; leaves 5-15 cm. long; branches not corky-

thickened..... 2. U. americana
b. Samaras pubescent; leaves 3-9 cm. long; branches often corky-thickened..... 3. U. alata

1. U. rubra Muhl. Slippery elm, red elm. Occasional; in low ground of woods bordering marshes. 569.
2. U. americana L. American elm, white elm. Fairly common; in low ground bordering marshes; dominant in wet open-floored area of main deer pen. 556, 564, 571.
3. U. alata Michx. Wahoo elm, winged elm. Occasional; in low ground of deer pen area. 550.

2. Celtis L. Hackberry, sugarberry.
1. C. occidentalis L. Fairly common; in mixed woods. 95, 107, 435.

27. MORACEAE

1. Morus L. Mulberry.
a. Leaves rough above, downy below, pointed..... 1. M. rubra
a. Leaves glabrous or glabrate above, hairy in axils below, blunt or short-pointed..... 2. M. alba

1. M. rubra L. Red mulberry. Common; in mixed woods, often in moist low ground. 112, 447, 584.
2. M. alba L. White mulberry. Occasional; an escape in mixed woods; persistent in areas near old town site. 305, 436, 595.

28. URTICACEAE

1. Boehmeria Jacq. False nettle.
1. B. cylindrica (L.) Sw. Bog-hemp. Common; in moist ground bordering brackish marshes and in low areas of pine woods. 133, 299, 838.

29. POLYGONACEAE

a. Sepals six, the outer three reflexed, the inner large, mostly developed into wings with a callous thickening..... 1. Rumex
a. Sepals 4 or 5, all ascending, subequal, often petaloid... b.
b. Styles 2-cleft, persistent in fruit and becoming reflexed; flowers remote on an elongate slender axis..... 2. Tovara
b. Styles 2 or 3, deciduous, not hooked; flowers fascicled or in racemes or panicles..... 3. Polygonum

1. Rumex L. Dock, sorrel.
a. Plants spreading by long slender rootstocks; basal leaves hastate; flowers dioecious; sepals not greatly enlarged in fruit ..... 4. R. acetosella
a. Plants with tap roots; basal leaves not hastate; flowers perfect or monoeciously polygamous; sepals enlarged in fruit... b.

b. Wings of sepals oblong, narrow, slightly broader than dorsal grain..... 3. R. conglomeratus
b. Wings of sepals orbicular to deltoid-ovate, much broader than dorsal grain... c.
c. Fruiting pedicel long, stiff and deflexed; leaves flat ..... 1. R. verticillatus
c. Fruiting pedicel short, not deflexed; leaves crisp-margined..... 2. R. crispus

1. R. verticillatus L. Swamp-dock, water-dock. Common; in ooze of brackish marshes. 41, 862, 890.
2. R. crispus L. Yellow dock. Fairly common; in dry soil of roadsides and waste places. 19, 264.
3. R. conglomeratus Murr. Fairly common; in dry soil of barren roadsides. 42, 73.
4. R. acetosella L. Sheep-sorrel, common sorrel. Fairly common; in dry soil of fields and grassy places. 153.

2. Tovara Adans. Jumpseed.
1. T. virginiana (L.) Raf. Occasional; along open roadsides. 362.

3. Polygonum L. Knotweed, smartweed.
a. Leaves sagittate or hastate; stems weak, reflexed-prickly... b.
b. Leaves sagittate; achenes trigonous..... 4. P. sagittatum
b. Leaves hastate; achenes lenticular..... 5. P. arifolium
a. Leaves generally lanceolate; stems glabrous or pubescent... c.
c. Plants annual; mature ocreae eciliate at margin; sepals pink to purplish..... 1. P. pensylvanicum
c. Plants perennial; mature ocreae ciliate at margin; calyx white or greenish-white... d.
d. Calyx punctate with numerous dark glands, 3.5-4 mm. long ..... 2. P. punctatum
d. Calyx punctate with few sessile white glands, 1.8-3 mm. long..... 3. P. opelousanum

1. P. pensylvanicum L. Pinkweed. Occasional; in wet soil, near sandy shore of the James River. 494.
2. P. punctatum Ell. Water-smartweed. Occasional; in wet soil of tiny inlet and of margin of brackish marshes. 324, 349.
3. P. opelousanum Riddell var. adenocalyx Stanford. Occasional; in low ground at edge of brackish marshes. 461.
4. P. sagittatum L. Arrow-leaved tearthumb. Occasional; in moist soil (this collection from old pilings in Back River). 870.
5. P. arifolium L. Halberd-leaved tearthumb. Occasional; in moist soil along margins of brackish marshes. 837.

30. CHENOPODIACEAE

1. Chenopodium L. Goosefoot, pigweed.
1. C. ambrosioides L. Mexican tea. Occasional; in dry sandy sterile ground; on bank above the James River. 405, 588.

31. AMARANTHACEAE

1. Acnida L. Water-hemp.
   1. A. cannabina L. Common; in brackish marshes. 318, 425, 527, 563.

32. PHYTOLACCACEAE

1. Phytolacca L. Pokeweed.
   1. P. americana L. Poke, pigeonberry. Occasional; on open roadsides. 281.

33. PORTULACACEAE

1. Claytonia L. Spring-beauty.
   1. C. virginica L. Occasional; in moist soil of low areas in woods and of low often-flooded meadow. 626.

34. CARYOPHYLLACEAE

a. Sepals not united, more or less spreading... b.
   b. Mature capsules oblong, dehiscent by valves; styles three ..... 1. Stellaria
   b. Mature capsules cylindric, dehiscent by ten terminal teeth; styles five..... 2. Cerastium
a. Sepals united in a tube... c.
   c. Calyx finely nerved, subtended by two or more narrow bracts ..... 5. Dianthus
   c. Calyx ebracteate at base... d.
      d. Styles three; flowers white, in simple elongate panicles ..... 3. Silene
      d. Styles two; flowers rose-pink, in corymbed clusters ..... 4. Saponaria

1. Stellaria L. Chickweed, starwort.
   1. S. media (L.) Cyrillo var. media. Common chickweed. Common; in dry soil of roadsides and of mowed lawn. 620, 641.

2. Cerastium L. Mouse-ear chickweed.
   a. Plants perennial; flowers cymose; bracts of inflorescence broadly scarious-margined..... 1. C. vulgatum
   a. Plants annual; flowers glomerate; bracts of inflorescence herbaceous..... 2. C. viscosum

   1. C. vulgatum L. Common mouse-ear chickweed. Fairly common; along open roadsides. 782B.
   2. C. viscosum L. Fairly common; along open roadsides. 665.

3. Silene L. Catchfly, campion.
   a. Cauline leaves whorled in fours; petals white, fringe-margined ..... 1. S. stellata

a. Cauline leaves opposite; petals pink, slightly notched or entire ..... 2. S. caroliniana

1. S. stellata (L.) Ait.f. Starry campion, widow's frill. Occasional; in sandy soil of open-floored mixed woods. 335.
2. S. caroliniana Walt. var. pensylvanica (Michx.) Fern. Wild pink. Rare; in clearings in mixed woods. 669.

4. Saponaria L.
1. S. officinalis L. Soapwort, bouncing Bet. Rare; in sandy soil at margin of old field. 60.

5. Dianthus L. Pink.
1. D. armeria L. Deptford pink. Occasional; in open areas, at margin of old field and along grassy roadsides. 7.

35. CERATOPHYLLACEAE

1. Ceratophyllum L. Hornwort.
1. C. echinatum Gray. Occasional; in shallow water of pools at edge of marshes. 627.

36. RANUNCULACEAE

a. Herbaceous plants; sepals five; petals regularly present; styles not elongate..... 1. Ranunculus
a. Half-woody climbing plants; sepals four, showy; petals none or small; styles elongate, plumose..... 2. Clematis

1. Ranunculus L. Crowfoot, buttercup.
a. Basal and cauline leaves entire..... 1. R. pusillus
a. Basal and/or cauline leaves deeply cleft or divided... b.
b. Plants glabrous; basal leaves reniform, undivided; achenes 1-1.5 mm. long... c.
c. Plants fleshy; cauline leaves petioled..... 2. R. sceleratus
c. Plants not fleshy; cauline leaves subsessile 3. R. abortivus
b. Plants pubescent; basal leaves ternately divided; achenes 2-3 mm. long... d.
d. Base a subglobose corm; petals longer than sepals, 8-14 mm. long; achenes smooth..... 4. R. bulbosus
d. Fibrous-rooted; petals and sepals subequal; achenes harshly muriculate..... 5. R. parviflorus

1. R. pusillus Poir. Low spearwort. Occasional; in wet ground of often flooded meadow. 673.
2. R. sceleratus L. Cursed crowfoot. Occasional; in wet soil or standing water, at muddy edges of brackish marshes and in wet meadow. 748, 848.
3. R. abortivus L. var. abortivus. Kidneyleaf buttercup. Rare; in moist soil of low area of mixed woods. 663.
4. R. bulbosus L. Bulbous buttercup. Fairly common; along open grassy roadsides. 681, 719, 750.

5. R. parviflorus L. Small-flowered crowfoot. Fairly common; in dry soil of open roadsides. 724.

2. Clematis L. Clematis.
   1. C. dioscoreifolia Lévl.& Vaniot var. robusta (Carr.) Rehd. Fairly common; in moist soil, climbing in small trees and bushes along shores of the James River. 330, 412.

37. BERBERIDACEAE

a. Plants smooth herbs; flower solitary, white, in fork between the two large lobed leaves; fruit a berry, yellow, 2.5-5 cm. long ..... 1. Podophyllum
a. Plants prickly yellow-wooded shrubs; flowers yellow, axillary; fruit few-seeded red berries..... 2. Berberis

1. Podophyllum L.
   1. P. peltatum L. Wild jalap, may-apple, mandrake. Occasional; in moist rich mixed woods; rarely flowering. 763.

2. Berberis L. Barberry.
   1. B. thunbergii DC. Japanese barberry. Occasional; an escape, in open areas, primarily adjacent to marshes. 506.

38. MAGNOLIACEAE

a. Leaves oval or oblong, entire; flowers large, white; fruits dorsally dehiscent follicles, coherent in a cone..... 1. Magnolia
a. Leaves 4-lobed, broadly notched at apex; flowers greenish-yellow with orange marking; fruits samara-like, indehiscent, falling singly..... 2. Liriodendron

1. Magnolia L. Magnolia.
   1. M. grandiflora L. Bull bay. Fairly common; escaped young saplings in open-floored pine woods. 488.

2. Liriodendron L. Tulip-tree.
   1. L. tulipifera L. Tulip-poplar. Occasional; in mixed deciduous woods. 178, 359.

39. LAURACEAE

a. Leaves shining above, evergreen; flowers perfect..... 1. Persea
a. Leaves deciduous; flowers unisexual... b.
   b. Leaves usually lobed, palmately veined; stems green; flowers in peduncled corymbiform racemes; drupes blue..... 2. Sassafras
   b. Leaves unlobed, pinnately veined; stems not green; flowers subsessile in lateral umbel-like clusters; drupes red ..... 3. Lindera

1. Persea Mill. Red bay.
   1. P. borbonia (L.) Spreng. Common; along moist edge of brackish marshes; young saplings in pine woods. 111, 538, 597.

2. Sassafras Nees. Sassafras.
   1. S. albidum (Nutt.) Nees. Fairly common; in open disturbed areas. 105, 432, 548.

3. Lindera Thunb. Wild allspice, feverbush.
   1. L. benzoin (L.) Blume. Spicebush, Benjamin-bush. Rare; in moist shady mixed woods. 565.

40. PAPAVERACEAE

a. Plants from thick prostrate rhizomes with red juice; leaves palmately lobed; flowers large, white, scapose..... 1. Sanguinaria
a. Plants annuals with watery juice; leaves finely dissected, compound; flowers small, in dense racemes..... 2. Fumaria

1. Sanguinaria L.
   1. S. canadensis L. Red puccoon, bloodroot. Rare; large colony in low moist mixed woods. 711.

2. Fumaria L. Fumitory, earth-smoke.
   1. F. officinalis L. Common fumitory. Occasional; in waste places in woods. 783.

41. CRUCIFERAE

a. Fruit less than 3 times as long as wide, a silicle... b.
   b. Cauline leaves absent; basal leaves in a definite rosette; silicle elliptic, flattened parallel to septum..... 1. Draba
   b. Cauline leaves present; silicle flattened contrary to septum... c.
      c. Silicles nearly circular, apically notched; seeds one in each locule..... 2. Lepidium
      c. Silicles inverted-triangular; seeds numerous.... 3. Capsella
a. Fruit more than 4 times as long as wide, a silique... d.
   d. Petals yellow... e.
      e. Terminal portion of silique forming a long indehiscent beak; seeds globose..... 4. Brassica
      e. Terminal portion of silique without long beak; seeds oblong..... 6. Barbarea
   d. Petals white... f.
      f. Basal leaves simple, entire, grouped in a rosette; plants pubescent with forking hairs; valves of silique stiffish, not rolling..... 5. Arabidopsis
      f. Basal and cauline leaves pinnatifid; plants without forking hairs; valves of silique rolling into rings upon falling..... 7. Cardamine

1. Draba L.
   1. D. verna L. Whitlow-grass. Occasional; in dry sterile ground of roadsides. 634.

2. Lepidium L. Pepperwort, peppergrass.
   1. L. virginicum L. Poor-man's pepper. Fairly common; in dry sandy soil of old fields and of upper beaches. 406, 771, 879.

3. Capsella Medic. Shepherd's-purse, shovelweed.
   1. C. rubella Reut. Rare; in dry ground adjacent to old field. 761.

4. Brassica L. Mustard, turnip.
   1. B. napus L. Turnip. Rare; escaped, in dry soil of roadsides. 720.

5. Arabidopsis Heynh. Mouse-ear-cress.
   1. A. thaliana (L.) Heynh. Occasional; in dry soil, of roadsides and of old fields. 633, 760.

6. Barbarea R.Br. Winter-cress.
   a. Basal leaves with 1-4 pairs of leaflets; upper leaves rarely pinnatifid; beak of silique slender, 1.5-3 mm. long... 1. B. vulgaris
   a. Basal leaves with 10-20 leaflets; upper leaves usually pinnatifid; beak of silique stout, 0.5-1(2) mm. long..... 2. B. verna

   1. B. vulgaris R.Br. var. vulgaris. Common winter-cress, yellow rocket. Occasional; along grassy roadsides. 645, 648.
   2. B. verna (Mill.) Aschers. Early winter-cress, Belle-Isle cress. Occasional; along roadsides; in grassy, seldom mowed lawn. 15, 637.

7. Cardamine L. Bitter cress.
   1. C. hirsuta L. Common; in mowed fields; along weedy roadsides; in disturbed areas of woods. 616, 621, 851.

42. HAMAMELIDACEAE

1. Liquidambar L.
   1. L. styraciflua L. Sweet gum, bilsted. Common; in moist soil of low areas of mixed woods, especially at margins of brackish marshes. 104, 136.

43. PLATANACEAE

1. Platanus L. Sycamore, buttonwood, plane-tree.
   1. P. occidentalis L. Occasional; in moist soil of low ground near brackish marshes; in open areas at edge of woods. 358.

44. ROSACEAE

a. Plants woody, trees or shrubs or vines... b.
  b. Ovary or ovaries inferior or enclosed in the calyx tube... c.
    c. Stems thorny; leaves pinnately compound; styles numerous ..... 8. Rosa
    c. Stems not thorny; leaves simple; styles 2-5... d.
      d. Flowers in cymes; pome 2-5-celled, red..... 2. Pyrus
      d. Flowers in racemes; pome 10-celled, purple to black ..... 3. Amelanchier
  b. Ovary or ovaries superior... e.
    e. Stems armed with prickles; leaves compound; fruit an aggregate of drupelets..... 6. Rubus
    e. Stems unarmed; leaves simple; fruit not an aggregate... f.
      f. Pistils commonly 5; fruit a dehiscent follicle .....1. Spiraea
      f. Pistil solitary; fruit a drupe..... 9. Prunus
a. Plants herbaceous... g.
  g. Plants caulescent; leaves pinnately compound; ovaries enclosed in calyx tube.....7. Agrimonia
  g. Plants acaulescent; leaves ternately compound; ovaries free.. h
    h. Leaflets 3; bractlets broadly 3-toothed; achenes borne on the surface of an enlarged red receptacle..... 4. Duchesnea
    h. Leaflets 5; bractlets narrow, entire; achenes borne on an unenlarged pale receptacle..... 5. Potentilla

1. Spiraea L. Spiraea.
  1. S. Prunifolia Sieb.& Zucc. Occasional; persistent in disturbed areas in vicinity of old home sites. 662.

2. Pyrus L.
  1. P. arbutifolia (L.) L.f. Red chokeberry. Rare; in shady moist pine woods. 10.

3. Amelanchier Medic. Juneberry, shadbush, serviceberry.
  1. A. canadensis (L.) Medic. Rare; in moist ground of bank above Back River. 707.

4. Duchesnea Sm. Indian strawberry.
  1. D. indica (Andr.) Focke. Common; in open dry ground of roadsides. 14, 85, 644.

5. Potentilla L. Cinquefoil, five-finger.
  1. P. canadensis L. Dwarf five-finger. Fairly common; in dry soil of open roadsides and grassy banks. 682.

6. Rubus L. Bramble.
  1. R. phoenicolasius Maxim. Wineberry. Fairly common; scattered through clearings in mixed woods, at edges of wooded areas bordering road cuts. 903.

7. Agrimonia L. Agrimony, cocklebur.
  1. A. rostellata Wallr. Occasional; in dry soil of open pine woods. 298.

8. Rosa L. Rose.

a. Styles united into a protruding column about equalling stamens... b.
  b. Leaflets membranaceous, deciduous; stipules pectinately toothed, glandular-ciliate; styles glabrous... 1. R. multiflora
  b. Leaflets firm, evergreen; stipules denticulate, eglandular; styles pubescent..... 2. R. wichuraiana
a. Styles distinct, shorter than stamens... c.
  c. Sepals all entire; fruit often glandular-hispid 5. R. palustris
  c. Sepals dimorphic, the outer pinnatifid; fruit glabrous... d.
    d. Leaflets heavily glandular, strongly aromatic, blunt to acutish; styles pubescent; flowers 3-5 cm. broad ..... 3. R. eglanteria
    d. Leaflets not strongly glandular above, slightly fragrant; acuminate; styles subglabrous; flowers 2-3 cm. broad .....4. R. micrantha

1. R. multiflora Thunb. Rare; an escape at margin of road-cut. 790.
2. R. wichuraiana Crepin. Memorial rose. Rare; an escape in a roadside gully. 8.
3. R. eglanteria L. Sweetbrier, eglantine. Rare; in waste ground above shores of Back River. 497.
4. R. micrantha Sm. Rare; in Myrica cerifera growth at margin of road-cut. 791.
5. R. palustris Marsh. Swamp rose. Fairly common; in brackish marshes; along shores of Back River. 35, 54, 562.

9. Prunus L. Plum, cherry.
a. Ovary and fruit pubescent; flowers solitary, subsessile; leaves subrotund..... 1. P. armeniaca
a. Ovary and fruit glabrous; flowers clustered, pedicelled... b.
  b. Flowers few, in small umbels; leaves coarsely and doubley dentate..... 2. P. avium
  b. Flowers numerous, racemose; leaves with blunt callous teeth, often rusty-villous on midrib beneath..... 3. P. serotina

1. P. armeniaca L. Apricot. Rare; persistent at edge of marsh in vicinity of old home site. 617.
2. P. avium L. Sweet cherry. Rare; an escape leaning from bank above shore of Back River. 440.
3. P. serotina Ehrh. Black cherry, rum cherry. Common; in pine woods; in mixed woods. 151, 545, 895.

45. LEGUMINOSAE

a. Plants woody, trees or shrubs... b.
  b. Leaves simple, rounded; flowers pink, papilionaceous, appearing before the leaves..... 4. Cercis
  b. Leaves compound; not both pink and papilionaceous... c.
    c. Plants shrubs; branches green, 4-angled; leaves trifoliolate ..... 6. Cytisus
    c. Plants trees; leaflets more than 3... d.
      d. Flowers papilionaceous, white, racemose..... 11. Robinia

d. Flowers not papilionaceous, not white, in spikes or heads... e.
e. Plants unarmed; flowers pink, in dense heads ..... 1. Albizzia
e. Plants often thorny; flowers greenish, inconspicuous, in small spikes..... 2. Gleditsia

a. Plants herbaceous... f.
f. Leaves with either 2 leaflets or 4 or more leaflets, not all trifoliolate... g.
g. Leaves odd-pinnate, terminated by a leaflet... h.
h. Plants ascending or reclining, not twining; leaflets 12-29, pubescent beneath; corolla white or purplish ..... 10. Tephrosia
h. Plants twining; leaflets 3-9, glabrous; corolla brown-purple..... 17. Apios
g. Leaves evenly pinnate, or the terminal leaflet a tendril.. i
i. Flowers papilionaceous; tendrils present... j.
j. Leaflets more than 2; stem not winged; style terete, bearded apically..... 15. Vicia
j. Leaflets of mature leaves 2; stem winged; style flattened above, bearded along inner side 16. Lathyrus
i. Flowers not papilionaceous; tendrils absent.... 3. Cassia
f. Leaflets three... k.
k. Leaflets serrulate... l.
l. Inflorescence capitate; petals persisting in fruit; legume membranaceous..... 7. Trifolium
l. Inflorescence racemose; petals deciduous in fruit; legume coriaceous... m.
m. Plants tall, erect; flowers white, in slender racemes 5-20 cm. long..... 8. Melilotus
m. Plants decumbent; flowers yellow, in short racemes to 1 cm. long..... 9. Medicago
k. Leaflets entire... n.
n. Stems erect, spreading or prostrate, but not twining.. o.
o. Stamens 10, distinct; legumes many-seeded 5. Baptisia
o. Stamens united; legumes 1-seeded or separating into 1-seeded sections... p.
p. Legume separating into 1-seeded sections, each covered with minute hooked hairs; calyx 2-lipped ..... 12. Desmodium
p. Legume not separating; calyx subequally 5-toothed... q.
q. Racemes axillary; corolla white or purple; stamens diadelphous..... 13. Lespedeza
q. Spikes terminal; corolla yellow; stamens monadelphous..... 14. Stylosanthes
n. Stems twining or trailing... r.
r. Corolla 2.5 cm. long or longer; calyx-lobes 5... s.
s. Calyx-lobes exceeding tube; standard not spurred; flowers 5-6 cm. long..... 19. Clitoria
s. Calyx-lobes shorter than tube; standard spurred at base of back; flowers 2.5-3.5 cm. long ..... 20. Centrosema
r. Corolla less than 2.5 cm. long; calyx-lobes 4... t.

t. Keel-petals strongly curved upward; style bearded ..... 18. Strophostyles
t. Keel-petals nearly straight; style beardless ..... 21. Amphicarpa

1. Albizzia Durazzini.
   1. A. julibrissin Durazzini. Silk tree, mimosa. Rare; an escaped sapling in weedy clearing in woods. 303.

2. Gleditsia L. Honey-locust.
   1. G. triacanthos L. Honey-shuck. Occasional; in full sun at margin of road-cuts. 100, 896.

3. Cassia L. Senna.
   a. Petals 10-20 mm. long; calyx 10 mm. long; stamens ten ..... 1. C. fasciculata
   a. Petals 4-8 mm. long; calyx 3-4 mm. long; stamens five ..... 2. C. nictitans

   1. C. fasciculata Michx. Partridge-pea, prairie-senna. Occasional; along open roadsides. 316.
   2. C. nictitans L. Wild sensitive plant. Fairly common; along open grassy roadsides; in weedy clearings. 265, 310, 366.

4. Cercis L. Redbud, Judas-tree.
   1. C. canadensis L. Redbud. Rare; in open areas; not an understory tree. 356.

5. Baptisia Vent. False indigo.
   1. B. tinctoria (L.) R.Br. Wild indigo, rattleweed. Occasional; at edge of pine woods along road-cuts. 1, 283.

6. Cytisus L. Broom.
   1. C. scoparius (L.) Link. Scotch broom. Occasional; adventive; in sandy soil above the James River. 674.

7. Trifolium L. Clover.
   a. Flowers sessile or subsessile in the heads; pedicels less than 0.5 mm. long... b.
      b. Plants annual; heads drab or grayish, ovoid-cylindric; flowers short-pedicelled.....1. T. arvense
      b. Plants biennial/ perennial; heads roseate, subglobose, subtended by a pair of leaves; flowers sessile.. 2. T. pratense
   a. Flowers distinctly pedicellate; pedicels elongating and reflexed in age... c.
      c. Stems creeping and rooting at nodes; heads 1.5-3 cm. wide; corolla white or rose-tinged.....3. T. repens
      c. Stems sometimes depressed, without runners; heads 0.8-1.2 cm. wide; corolla yellow, becoming marcescent 4. T. procumbens

   1. T. arvense L. Rabbit-foot clover, old-field clover. Occasional; along open roadsides; in seldom mowed lawn. 211.
   2. T. pratense L. Red clover. Occasional; in heavily weedy areas at roadsides. 120.

3. T. repens L. White clover. Fairly common; in lawns; along open roadsides. 74.
4. T. procumbens L. Low hop-clover. Fairly common; in lawns; along open roadsides. 39, 770.

8. Melilotus Mill. Melilot, sweet clover.
1. M. alba Desr. White sweet clover. Occasional; in sandy soil above the James River; on roadside banks. 51, 337, 881.

9. Medicago L. Medick.
1. M. lupulina L. Black medick, nonesuch. Occasional;in open dry old field. 172.

10. Tephrosia Pers. Hoary pea.
1. T. sp. Occasional; in dry open pine woods. 344 (Specimen sterile).

11. Robinia L. Locust.
1. R. pseudo-acacia L. Black locust, false acacia. Common; in clearings; in mixed woods. 307, 438, 543.

12. Desmodium Desv. Tick-trefoil, beggar's-ticks.
a. Flowering stems leafless; flowers 6-8 mm. long; stamens monadelphous.....1. D. nudiflorum
a. Flowering stems with densely tomentose leaves; flowers 8-11 mm. long; stamens diadelphous..... 2. D. viridiflorum

1. D. nudiflorum (L.) DC. Occasional; in dry ground of clearings in mixed woods. 201.
2. D. viridiflorum (L.) DC. Velvety tick-trefoil. Occasional; in thick growth at edge of road-cuts through pine woods. 360.

13. Lespedeza Michx. Bush-clover.
a. Stems trailing or procumbent; leaflets elliptic; corolla purplish ..... 1. L. repens
a. Stems erect, somewhat shrubby, virgate; leaflets linear-cuneate; corolla white, purple-veined..... 2. L. cuneata

1. L. repens (L.) Bart. Common; along open roadsides. 129, 205, 276, 289.
2. L. cuneata (Dumont) G.Don. Occasional; in dry soil of roadsides and disturbed areas. 357.

14. Stylosanthes Sw. Pencil-flower.
1. S. biflora (L.) BSP. Fairly common; in dry soil of open roadsides. 89, 128.

15. Vicia L. Vetch, tare.
a. Peduncles many times shorter than the leaflets; flowers 1-6... b.
b. Flowers 6-8 mm. long, solitary; legume flattened; tendrils unbranched..... 1. V. lathyroides
b. Flowers 10-18 mm. long, chiefly in twos; legume terete; tendrils forking..... 2. V. angustifolia
a. Peduncles distinct, nearly or quite as long as leaflets;

flowers 3-many... c.
c. Flowers 3-4 mm. long, whitish, in clusters of 3-6 ..... 3. V. hirsuta
c. Flowers 10-15 mm. long, violet, 3-40 or more... 4. V. dasycarpa

1. V. lathyroides L. Occasional; in weedy areas of roadside banks and of edges of mowed lawn. 664, 758.
2. V. angustifolia Reichard var. uncinata (Desv.) Rouy. Common vetch. Fairly common; in weedy areas; on roadside bank. 672.
3. V. hirsuta (L.) S.F.Gray. Hairy vetch. Fairly common; in thick weedy growths along roadsides and in waste places. 788, 889.
4. V. dasycarpa Ten. Winter vetch. Rare; on dry weedy bank at edge of lawn above the James River. 883.

16. Lathyrus L. Vetchling, wild pea.
1. L. hirsutus L. Rare; on weedy bank at edge of lawn above the James River. 884.

17. Apios Medic. Groundnut, wild bean.
1. A. americana Medic. Occasional; in moist soil of weedy areas; at edge of woods bordering marsh. 332.

18. Strophostyles Ell. Wild bean.
1. S. umbellata (Muhl.) Britt. Occasional; along open roadsides. 245, 282.

19. Clitoria L. Butterfly-pea.
1. C. mariana L. Occasional; in dry soil along roadsides. 130, 287.

20. Centrosema (DC.) Benth. Butterfly-pea.
1. C. virginianum (L.) Benth. Fairly common; on grassy roadside banks; on sandy banks above the James River. 126, 144, 413.

21. Amphicarpa Ell. Hog-peanut.
1. A. bracteata (L.) Fern. Occasional; in gravelly soil of clearings in woods adjacent to marsh. 361.

46. OXALIDACEAE

1. Oxalis L. Wood-sorrel, lady's-sorrel.
a. Plants scapose; leaves basal; corolla rose-purple.. 1. O. violacea
a. Plants with cauline leaves; corolla yellow... b.
b. Flowers 1-5, umbellate; fruiting pedicels curved, horizontal or deflexed..... 2. O. stricta
b. Flowers 1-9, cymose; fruiting pedicels straight, erect or ascending..... 3. O. europaea

1. O. violacea L. Violet wood-sorrel. Fairly common; in beds in shady mixed woods. 375, 696, 710.
2. O. stricta L. Yellow wood-sorrel. Common; in dry soil of roadsides and waste places. 16, 677, 751.

3. Q. europaea Jord. Occasional; in weedy clearings in moist woods. 109.

47. GERANIACEAE

1. Geranium L. Cranesbill.
   a. Corolla pale purple to white; sepals subulate-tipped; seeds areolate..... 1. G. carolinianum
   a. Corolla deep purple; sepals not subulate-tipped; seeds smooth ..... 2. G. molle

   1. G. carolinianum L. Common; in dry soil of open roadsides and grassy places. 733.
   2. G. molle L. Dovesfoot-cranesbill. Occasional; in mowed lawns and in shady weedy waste areas. 757, 785.

48. SIMAROUBACEAE

1. Ailanthus Desf. Tree-of-heaven.
   1. A. altissima (Mill.) Swingle. Copal-tree. Fairly common; escaped in waste places and along margins of road-cuts. 555, 570.

49. MELIACEAE

1. Melia L.
   1. M. azedarach L. Pride-of-India, China-tree. Rare; persistent in a weedy clearing in woods at an old home site. 850.

50. POLYGALACEAE

1. Polygala L. Polygala, milkwort.
   a. Leaves all alternate; racemes capitate, short-ovoid or cylindric; corolla pink or rose..... 1. P. mariana
   a. Leaves of lower nodes whorled; racemes slenderly lanceolate, loosely flowered; corolla white or pinkish..... 2. P. verticillata

   1. P. mariana Mill. Rare; on shady bare roadside bank under pines. 352.
   2. P. verticillata L. var. ambigua (Nutt.) Wood. Occasional; along dry open weedy roadsides. 210.

51. EUPHORBIACEAE

   a. Juice of plants not milky; flowers racemose, green; involucre absent; calyx present.....1. Acalypha
   a. Juice of plants milky; flowers cymose, white, surrounded by a cup-like involucre; calyx absent..... 2. Euphorbia

1. Acalypha L. Three-seeded mercury, copperleaf.
   1. A. gracilens Gray. Rare; on open bank above Back River. 441.

2. Euphorbia L. Spurge.
   1. E. corollata L. Flowering spurge, tramp's spurge. Occasional; in dry sandy soil of waste places. 175.

52. ANACARDIACEAE

1. Rhus L. Sumac, poison ivy.
   a. Leaves compound with 11-23 leaflets; leaf-rachises winged; inflorescence a dense terminal panicle; drupes red, pubescent ..... 1. R. copallina
   a. Leaves tri-foliolate; leaf-rachises wingless; inflorescence an axillary panicle of yellowish-green flowers; fruit whitish, glabrous..... 2. R. radicans

   1. R. copallina L. Dwarf sumac, winged sumac. Occasional; in thick growths, often at edges of marshes. 542, 592.
   2. R. radicans L. Poison ivy. Abundant; in woods; in waste places. 832.

53. AQUIFOLIACEAE

1. Ilex L. Holly.
   a. Leaves coriaceous, evergreen, their margins spiny-toothed; calyx-segments ciliate..... 1. I. opaca
   a. Leaves sub-membranaceous, deciduous, crenate; calyx-segments eciliate..... 2. I. decidua

   1. I. opaca Ait. American holly. Common; in shady moist pine woods and mixed woods. 113, 581.
   2. I. decidua Walt. Possum-haw. Occasional; in low ground of mixed woods near brackish marshes. 578, 580.

54. CELASTRACEAE

1. Euonymus L. Spindle-tree.
   1. E. americanus L. Strawberry-bush, bursting-heart. Occasional; small shoots in mixed woods and in pine woods. 886.

55. ACERACEAE

1. Acer L. Maple.
   a. Leaves compound, three-foliolate or pinnate..... 4. A. negundo
   a. Leaves simple... b.
      b. Major sinuses of leaves rounded; flowers pedicelled, greenish, appearing with the leaves..... 1. A. platanoides
      b. Major sinuses of leaves angled; flowers sessile, red to yellow, appearing well before the leaves... c.

c. Petals present, deep red; ovaries and young samaras glabrous; leaves rarely cleft half-way to base 2. A. rubrum
c. Petals absent; ovaries and young samaras villous; leaves deeply cleft..... 3. A. saccharinum

1. A. platanoides L. Norway maple. Fairly common; persistent along now-overgrown old farm road. 102, 635.
2. A. rubrum L. Red maple, swamp maple. Common; in moist low ground along marshes; in mixed woods. 103, 487.
3. A. saccharinum L. Silver maple, white maple. Rare; probably a planting at edge of woods adjacent to Isthmus. 355.
4. A. negundo L. Box-elder, ash-leaved maple. Fairly common; in moist shady mixed woods; along margin of marshes. 472, 505.

56. BALSAMINACEAE

1. Impatiens L. Balsam, jewelweed, touch-me-not.
1. I. capensis Meerb. Spotted touch-me-not, snapweed. Fairly common; in low wet soil adjacent to brackish marshes; along shores of Back River and the James River. 866.

57. RHAMNACEAE

1. Berchemia Neck. Supple-jack, rattan-vine.
1. B. scandens (Hill) K.Koch. Occasional; climbing into Pinus taeda in shady woods; climbing near marsh edges. 302, 606, 849.

58. VITACEAE

a. Leaves digitately compound; inflorescence cymose; fruit a berry with thin flesh..... 1. Parthenocissus
a. Leaves simple; inflorescence paniculate; fruit a juicy berry ..... 2. Vitis

1. Parthenocissus Planch. Virginia creeper, woodbine.
a. Tendrils with terminal adhesive disks; inflorescence with a central axis, of 25-300 or more flowers; fruit 5-7 mm. in diameter..... 1. P. quinquefolia
a. Tendrils without adhesive disks; inflorescence with two subequal divergent branches, of 10-60 flowers; fruit 8-10 mm. in diameter ..... 2. P. inserta

1. P. quinquefolia (L.) Planch. Fairly common; climbing in pine woods and in mixed woods. 155.
2. P. inserta (Kerner) K.Fritsch. Occasional; persistent; on rocks above the James River. 390.

2. Vitis L. Grape.
a. Young leaves reddish-cobwebby beneath, the hairs subpersistent; branchlets pubescent..... 1. V. aestivalis

a. Young leaves lightly pilose, glabrate; branchlets glabrate ..... 2. V. vulpina

1. V. aestivalis Michx. Summer-grape, pigeon-grape. Occasional; in low moist areas of woods. 20.
2. V. vulpina L. Frost-grape, chicken-grape. Common; high-climbing in pine woods; along road-cuts; at edge of brackish marshes. 399.

59. MALVACEAE

a. Petals roseate, to 4.5 cm. long; column (including styles) 1.5-2.5 cm. long; locules 1-seeded..... 1. Kosteletzkya
a. Petals pink to white with a crimson base, longer; column about 4.4 cm. long, pubescent; locules 2-several-seeded..... 2. Hibiscus

1. Kosteletzkya Presl. Seashore-mallow.
1. K. virginica (L.) Presl. Fairly common; in brackish marshes. 320, 342.

2. Hibiscus L. Rose-mallow.
1. H. palustris L. forma peckii House. Swamp rose-mallow, marsh-mallow. Common; in brackish marshes; along sandy shores of the James River. 138, 203.

60. GUTTIFERAE

a. Sepals 4, in 2 unequal pairs; petals 4; stamens many, distinct ..... 1. Ascyrum
a. Sepals 5, subequal; petals 5; stamens often clustered ..... 2. Hypericum

1. Ascyrum L. St. Peter's-wort.
1. A. hypericoides L. St. Andrew's cross. Rare; on dry grassy roadsides. 267.

2. Hypericum L. St. John's-wort.
a. Stamens in 3 or 5 fascicles; petals conspicuously black-dotted; capsule 3-celled, glandular..... 1. H. punctatum
a. Stamens not fascicled; petals not dotted; capsule 1-celled, eglandular... b.
b. Stems diffusely branched; capsule short-ellipsoid, 2.5-3.5 mm. long..... 2. H. mutilum
b. Stems simple, virgate; capsule slender-conical, 4-5 mm. long ..... 3. H. gymnanthum

1. H. punctatum Lam. Fairly common; along dry open roadsides. 116, 157.
2. H. mutilum L. Occasional; along open roadsides. 156, 236.
3. H. gymnanthum Engelm.& Gray. Rare; in roadside gully. 84.

61. CISTACEAE

a. Plants prostrate, heath-like, bushy; leaves scale-like, concealed by pubescence; petals 5, yellow, conspicuous..... 1. Hudsonia
a. Plants erect, stems solitary or few; leaves elliptic, somewhat pubescent; petals 3, dark red, not showy..... 2. Lechea

1. Hudsonia L. Hudsonia.
   1. H. tomentosa Nutt. Beach-heath, false-heather. Occasional; on low dunes of shores of the James River. 415, 591, 740.

2. Lechea L. Pinweed.
   1. L. racemulosa Michx. Occasional; along dry weedy roadsides. 209.

62. VIOLACEAE

1. Viola L. Violet.
   a. Plants caulescent; petals bluish-white to creamy ..... 6. V. kitaibeliana
   a. Plants acaulescent; flowers scapose; petals blue to violet... b.
      b. Principal leaves deeply lobed or divided... c.
         c. Petioles and lower leaf-surfaces villous..... 4. V. triloba
         c. Petioles and lower leaf-surfaces glabrous.....5. V. stoneana
      b. Principal leaves not deeply lobed or divided... d.
         d. Leaves and petioles pilose; blades oblong-ovate, often subhastately lobed at base..... 3. V. fimbriatula
         d. Leaves and petioles glabrous; blades cordate-ovate, regularly toothed... e.
            e. Spurred petal beardless at base; cleistogamous flowers on prostrate peduncles..... 1. V. papilionacea
            e. Spurred petal bearded at base; cleistogamous flowers on upright peduncles..... 2. V. affinis

   1. V. papilionacea Pursh. Meadow-violet, common blue violet. Fairly common; in moist soil of low ground in woods, often near shoreline. 699, 744.
   2. V. affinis Le Conte. Le Conte's violet. Occasional; in shady moist mixed woods; in moist low areas at roadsides. 680, 688.
   3. V. fimbriatula Sm. Rare; in clumps along open roadside. 651.
   4. V. triloba Schwein. Three-lobed violet. Rare; in shady moist mixed woods. 687.
   5. V. stoneana House. Stone's violet. Occasional; in shady moist mixed woods. 675, 712.
   6. V. kitaibeliana R.& S. var. rafinesquii (Greene) Fern. Field pansy. Occasional; along weedy roadsides. 623.

63. PASSIFLORACEAE

1. Passiflora L. Passion-flower.
   a. Leaves 3-lobed at summit; petioles glandless; flowers 1.5-2.5 cm. broad, greenish-yellow..... 1. P. lutea

a. Leaves 3-5 cleft; petioles with two basal glands; flowers 5-8 cm. broad, nearly white with a triple purple and flesh-colored crown..... 2. P. incarnata

1. P. lutea L. Yellow passion-flower. Rare; entwined in Myrica cerifera at roadside. 170.
2. P. incarnata L. Apricot-vine. Rare; in sandy soil of upper beaches of the James River. 414, 419.

64. CACTACEAE

1. Opuntia Mill. Prickly pear, Indian fig.
   1. O. humifusa Raf. Occasional; in dry sandy soil along the James River. 5, 57.

65. LYTHRACEAE

a. Plants woody, small trees or shrubs; leaves ovate to obovate; flowers paniculate; petals large, roseate to white, crisped ..... 2. Lagerstroemia

a. Plants herbaceous or woody only at base; leaves lanceolate; flowers axillary, subsessile... b.

b. Leaves often whorled, 5-15 cm. long; flowers densely clustered; petals magenta, 10-15 mm. long; stamens 10..... 1. Decodon

b. Leaves opposite, 2-3 cm. long; flowers small, solitary, sessile; petals whitish or pale lilac, about 3 mm. long; stamens 5..... 3. Lythrum

1. Decodon J.F.Gmel. Swamp-loosestrife.
   1. D. verticillatus (L.) Ell. Water-willow, water-oleander. Rare; in shallow water of sunken marshy area in woods. 839.

2. Lagerstroemia L.
   1. L. indica L. Crape-myrtle. Rare; persistent in open dry ground near old home site. 427.

3. Lythrum L. Loosestrife.
   1. L. lineare L. Rare; in low wet ground at edge of brackish marsh. 325.

66. NYSSACEAE

1. Nyssa L. Tupelo, pepperidge, sour gum.
   1. N. sylvatica Marsh. Collections suggest varieties sylvatica, dilatata Fern., and caroliniana (Poir.) Fern., as recognized by Fernald. Abundant; in moist soil along edges of marshes and in low areas of mixed woods; along road-cuts. 18, 346, 393, 394, 420, 467, 514.

67. MELASTOMACEAE

1. Rhexia L. Deergrass, meadow-beauty.
   1. R. ventricosa Fern.& Grisc. Occasional; along grassy roadsides. 123, 189, 254.

68. ONAGRACEAE

a. Flower parts in twos; fruit indehiscent, with strong hooked bristles..... 3. Circaea
a. Flower parts in fours or more numerous; fruit dehiscent, glabrous or pubescent, not bristly... b.
b. Calyx-tube not prolonged beyond ovary, persistent; capsule subcubical..... 1. Ludwigia
b. Calyx-tube prolonged beyond ovary, deciduous; capsule long, slenderly cylindric..... 2. Oenothera

1. Ludwigia L. False loosestrife.
a. Plants erect; leaves alternate; flowers pedicelled; petals yellow, conspicuous..... 1. L. alternifolia
a. Plants repent; leaves opposite; flowers subsessile; petals green, minute..... 2. L. palustris

1. L. alternifolia L. Seedbox. Occasional; along grassy roadsides. 161, 275.
2. L. palustris (L.) Ell. var. nana Fern.& Grisc. Water purslane. Rare; in wet soil of low often flooded meadow. 800.

2. Oenothera L. Evening-primrose.
a. Biennial; leaves repand-denticulate, 10-20 cm. long; calyx-lobes 10-25 mm. long; petals 10-25 mm. long..... 1. O. biennis
a. Annual; leaves sinuate-pinnatifid, 3-8 cm. long; calyx-lobes 6-12 mm. long; petals 5-18 mm. long..... 2. O. laciniata

1. O. biennis L. Rare; in dry sandy soil along the James River shore. 338.
2. O. laciniata Hill. Occasional; in dry sandy soil of lawn, stunted by mowing. 775.

3. Circaea L. Enchanter's nightshade.
   1. C. quadrisulcata (Maxim.) Franch.& Sav. var. canadensis (L.) Hara. Occasional; in shady mixed woods. 110.

69. ARALIACEAE

a. Erect shrubs or trees with coarsely prickly trunks; leaves twice to three times pinnately compound, deciduous..... 1. Aralia
a. Creeping or climbing shrubs with aerial roots; leaves simple, 3-5-lobed, evergreen..... 2. Hedera

1. Aralia L.
   1. A. spinosa L. Hercules'-club, devil's-walking-stick. Rare;

in low moist areas of waste places. 482.

2. Hedera L. Ivy.
   1. H. helix L. English ivy. Rare; persistent; climbing into Pinus taeda in mixed woods. 446, 625.

70. UMBELLIFERAE

a. Leaves all simple... b.
   b. Plants erect; leaves cauline, pinnately veined; inflorescence densely capitate, bracteate.....4. Eryngium
   b. Plants creeping; flower-clusters and leaves arising from the nodes of a prostrate stem; umbels simple, ebracteate... c.
      c. Leaves clavate cross-septate hollow phyllodia 9. Lilaeopsis
      c. Leaves petioled, ovate to reniform... d.
         d. Leaves suborbicular to reniform, peltate; involucral bracts minute..... 1. Hydrocotyle
         d. Leaves cordate-ovate; involucre of two ovate bracts ..... 2. Centella
a. Leaves, at least in part, compound... e.
   e. Ovary and fruit with spreading prickles... f.
      f. Perfect flowers subsessile, glomerulate; basal leaves long-petioled; blades broad, digitate..... 3. Sanicula
      f. Flowers all perfect, pedicelled; basal leaves pinnately decompound, their ultimate divisions linear..... 11. Daucus
   e. Ovary and fruit smooth or with wings or ribs... g.
      g. Cauline leaves much dissected... h.
         h. Ultimate leaf-segments elliptic, pubescent beneath ..... 5. Chaerophyllum
         h. Ultimate leaf-segments filiform, glabrous... i.
            i. Plants annual, without odor of anise; flowers white; involucral bracts filiform..... 8. Ptilimnium
            i. Plants perennial, with anise odor; flowers yellow; involucral bracts absent..... 10. Foeniculum
      g. Cauline leaves compound, but not dissected... j.
         j. Leaves twice to three times pinnately compound 6. Cicuta
         j. Leaves once-pinnate with 7-17 subsessile leaflets 7. Sium

1. Hydrocotyle L. Water-pennywort, navelwort.
   1. H. verticillata Thunb.
      var. verticillata. Flowers and fruit sessile or subsessile. Common; in wet soil at edge of brackish marshes; spreading to roadsides. 125, 283.
      var. triradiata (A.Richard) Fern. Flowers and fruit pedicillate; pedicels 1-10 mm. long. Fairly common; in wet soil at edge of brackish marshes. 46.

2. Centella L.
   1. C. erecta (L.f.) Fern. Occasional; in narrow mud flats at margin of brackish marshes. 148.

3. Sanicula L. Sanicle, black snakeroot.
   1. S. canadensis L. Occasional; in shady mixed woods. 56.

4. Eryngium L. Eryngo.
   1. E. aquaticum L. Rare; in low wet ground adjacent to Spartina marsh. 341.

5. Chaerophyllum L.
   1. C. tainturieri Hook. Occasional; in grassy places, on roadsides and in clearings in woods. 789, 816.

6. Cicuta L. Water-hemlock.
   1. C. maculata L. Spotted cowbane, beaver-poison. Fairly common; in wet soil along edges of brackish marshes and in sunken marshy areas. 206, 223.

7. Sium L. Water-parsnip.
   1. S. suave Walt. Fairly common; in shallow water of sunken marshy areas. 197.

8. Ptilimnium Raf. Mock bishop's-weed.
   1. P. capillaceum (Michx.) Raf. Occasional; in low wet ground adjacent to Spartina marsh. 142.

9. Lilaeopsis Greene.
   1. L. chinensis (L.) Ktze. Occasional; in dense colonies below high water line along sandy shores of the James River. 416, 865.

10. Foeniculum Mill. Fennel.
    1. F. vulgare Mill. Rare; in overgrown bed of old farm road. 549, 905.

11. Daucus L. Carrot.
    1. D. carota L. Wild carrot, Queen Anne's-lace. Common; along open roadsides. 40, 117.

71. CORNACEAE

1. Cornus L. Cornel, dogwood.
   1. C. florida L. Flowering dogwood. Abundant; an understory tree in pine woods and in deciduous woods. 98, 519.

72. PYROLACEAE

a. Plants with chlorophyll, slightly woody; leaves thick, shining, striped with white; peduncles 1-5-flowered..... 1. Chimaphila
a. Plants without chlorophyll, fleshy-stemmed, waxy-white or pink-tinged; leaves reduced to scales; flowers solitary... 2. Monotropa

1. Chimaphila Pursh. Pipsissewa, wintergreen, waxflower.
   1. C. maculata (L.) Pursh. Spotted wintergreen. Fairly common; in heavy pine litter of woods; in mixed woods. 67, 76, 313.

2. Monotropa L. Indian-pipe, pinesap.
   1. M. uniflora L. Indian-pipe, convulsion-root. Rare; in moist shady heavily littered pine woods. 308, 533.

73. ERICACEAE

a. Plants trees; inflorescence a large terminal panicle; fruit a dehiscent capsule..... 1. Oxydendrum
a. Plants shrubs or low and creeping; inflorescence a raceme or a short spike; fruit a drupe or berry... b.
   b. Plants prostrate, creeping, scarcely shrubby; corolla salverform, rose-colored, pubescent inside; ovary superior 2. Epigaea
   b. Plants ascending, branching shrubs, corolla various in shape, not rose-colored, glabrous; ovary inferior... c.
      c. Leaves with yellow resin droplets; ovary 10-celled; fruit a berry-like drupe..... 3. Gaylussacia
      c. Leaves without resin droplets; ovary 4-5-celled; fruit a berry..... 4. Vaccinium

1. Oxydendrum DC. Sorrel-tree, sourwood.
   1. O. arboreum (L.) DC. Titi. Rare; in mixed woods. 911.

2. Epigaea L. Ground laurel, trailing arbutus.
   1. E. repens L. var. repens. Mayflower. Rare; on moist mossy bank at edge of woods above Back River. 629.

3. Gaylussacia HBK. Huckleberry.
a. Leaves glandular only on lower surface; racemes exceeding leaves; fruit blue, glaucous..... 1. G. frondosa
a. Leaves glandular on both surfaces; racemes shorter than leaves; fruit black, not glaucous..... 2. G. baccata

   1. G. frondosa (L.) T.& G. Dangleberry, blue-tangle. Fairly common; forming large colonies in clearings of mixed woods. 727, 766.
   2. G. baccata (Wang.) K.Koch. Black huckleberry. Fairly common; forming large colonies in clearings of mixed woods. 350, 726.

4. Vaccinium L. Blueberry, bilberry, cranberry.
a. Corolla open-campanulate; anthers exsert, awned; flowers on filiform pedicels in bracted racemes..... 1. V. stamineum
a. Corolla urceolate; anthers included, not awned; flowers short-pedicelled in dense clusters... b.
   b. Leaves glabrous, glaucous, half-grown at flowering; corolla dull white; berries glaucous..... 2. V. caesariense
   b. Leaves pubescent beneath, unexpanded at flowering; corolla whitish, red-tinged; berries without bloom.... 3. V. atrococcum

   1. V. stamineum L. Deerberry, squaw-huckleberry. Rare; in clearings of deciduous woods. 776.
   2. V. caesariense Mackenz. Highbush-blueberry, New Jersey blueberry. Rare; in shady mixed woods. 693.

3. V. atrococcum (Gray) Heller. Black highbush-blueberry. Occasional; in moist soil of deciduous woods bordering marshes, 666.

74. PRIMULACEAE

a. Leaves alternate; inflorescence terminal, racemose; ovary half-inferior..... 3. Samolus
a. Leaves opposite or whorled; flowers axillary, solitary; ovary superior... b.
b. Plants erect, perennial; leaves often whorled, 3-9 cm. long; corolla yellow, black-streaked..... 1. Lysimachia
b. Plants procumbent, annual; leaves sessile, 1-2 cm. long; corolla scarlet, rarely white, with stalked glands 2. Anagallis

1. Lysimachia L. Loosestrife.
1. L. quadrifolia L. Whorled loosestrife. Rare; in clearing of deciduous woods. 901.

2. Anagallis L. Pimpernel.
1. A. arvensis L. Common pimpernel, scarlet pimpernel. Fairly common; in pine litter along open roadsides. 3, 198.

3. Samolus L. Water-pimpernel, brookweed.
1. S. parviflorus Raf. Occasional; on mud flats along edge of brackish marshes. 847.

75. EBENACEAE

1. Diospyros L. Persimmon.
1. D. virginiana L. Common persimmon. Abundant; in mixed woods; in waste places; along road-cuts. 93, 395, 852.

76. OLEACEAE

a. Leaves pinnately compound; flowers apetalous, usually unisexual; fruit a dry indehiscent samara..... 1. Fraxinus
a. Leaves simple; flowers with salverform corollas, perfect; fruit a berry-like drupe..... 2. Ligustrum

1. Fraxinus L. Ash.
a. Leaflets whitened beneath, not decurrent; samaras 2.5-5 cm. long, the wing scarcely decurrent..... 1. F. americana
a. Leaflets green beneath, decurrent along upper half of short petiolule; samaras 4-7.5 cm. long, the wing decurrent to middle of body..... 2. F. pennsylvanica

1. F. americana L. var. biltmoreana (Beadle) J.Wright. White ash. Occasional; in moist mixed woods. 531.
2. F. pennsylvanica Marsh. Red ash. Rare; in sandy soil of low ground at shore of Back River. 875.

2. Ligustrum L. Privet.
   a. Branchlets and leaves subglabrous; panicle dense, 3-6 cm. long; drupe 6-8 mm. long..... 1. L. vulgare
   a. Branchlets densely pubescent; leaves pubescent on midrib beneath; panicle loose, pubescent, 6-10 cm. long; drupe 4 mm. long..... 2. L. sinense

   1. L. vulgare L. Common privet. Rare; an escape in clearing of mixed woods. 876B.
   2. L. sinense Lour. Chinese privet. Occasional; persistent in open field near old home site and along road-cuts. 598, 869.

77. LOGANIACEAE

1. Polypremum L.
   1. P. procumbens L. Fairly common; in grassy waysides. 121, 218.

78. GENTIANACEAE

1. Sabatia Adans. Sabatia.
   a. Plants perennial; flowers 8-12-merous; corolla-lobes 16-22 mm. long..... 3. S. dodecandra
   a. Plants annual or biennial; flowers 4-7-merous, usually 5-merous; corolla-lobes 8-20 mm. long... b.
      b. Stem prominently 4-angled; branches of inflorescence opposite ..... 1. S. angularis
      b. Stem not angled; unbranched or the branches alternate ..... 2. S. stellaris

      1. S. angularis (L.) Pursh. Rose-pink, bitter-bloom. Fairly common; at edge of woods and in grassy places along roadsides. 158, 251, 293.
      2. S. stellaris Pursh. Sea-pink, marsh-pink. Rare; in low soggy ground adjacent to Spartina marsh. Only forma albiflora Britt., the white-flowered form of this pink-flowered species, was found. 323.
      3. S. dodecandra (L.) BSP. Large marsh-pink, sea-pink. Rare; in low soggy ground adjacent to Spartina marsh. 321.

79. APOCYNACEAE

1. Apocynum L. Dogbane, Indian hemp.
   1. A. cannabinum L. Indian hemp. Fairly common; along open dry roadsides. 269, 270.

80. ASCLEPIADACEAE

   a. Stems erect; inflorescence umbellate; corolla-lobes reflexed; corona of five ascending hoods, each with an exsert basal horn ..... 1. Asclepias

a. Stems twining; inflorescence cymose; corolla-lobes purple-brown, spreading; corona discoid, 5- or 10-lobed..... 2. Gonolobus

1. Asclepias L. Milkweed, silkweed.
a. Stems villous or hirsute; juice not milky; cauline leaves alternate; corolla and hoods orange or yellow..... 1. A. tuberosa
a. Stems glabrous or softly pubescent; juice milky; cauline leaves opposite... b.
b. Leaves narrowly lanceolate; umbels loosely flowered; corolla red; hoods scarlet..... 2. A. lanceolata
b. Leaves oblong-lanceolate to ovate; umbels many-flowered; corolla white to rose-purple... c.
c. Corolla pink to rose-purple; hoods about equalling gynostegium; horns exsert..... 3. A. incarnata
c. Corolla bright white with purple center; hoods surpassing gynostegium; horns not exsert..... 4. A. variegata

1. A. tuberosa L. Butterfly-weed, pleurisy-root. Occasional; in open sandy field; along open roadsides. 59, 137.
2. A. lanceolata Walt. Rare; in low soggy ground adjacent to Spartina marsh. 140.
3. A. incarnata L. Swamp-milkweed. Rare; in low soggy ground adjacent to Spartina marsh. 322.
4. A. variegata L. White-milkweed. Occasional; in weedy clearings of mixed woods; along weedy roadsides. 44, 885.

2. Gonolobus Michx. Angle-pod.
1. G. suberosus (L.) R.Br. Fairly common; on floor of open pine woods; climbing into Myrica cerifera in open areas. 188, 594.

81. CONVOLVULACEAE

a. Plants non-parasitic, green, leafy; corolla funnelform, 3-5 cm. long, sky blue..... 1. Ipomoea
a. Plants parasitic, yellowish, with a few minute scales; corolla campanulate, 0.2-0.3 cm. long, whitish..... 2. Cuscuta

1. Ipomoea L. Morning-glory.
1. I. hederacea (L.) Jacq. Rare; in sparsely weedy pine woods. 354.

2. Cuscuta L. Dodder, strangle-weed.
1. C. compestris Yuncker. Common; parasitic on roadside grasses and herbs. 221, 250.

82. BORAGINACEAE

a. Nutlets smooth; flowers blue or white..... 2. Myosotis
a. Nutlets armed with hooked bristles... b.
b. Leaves 10-20 cm. long, more or less cordate-clasping; nutlets 5.5-7 mm. long..... 1. Cynoglossum
b. Leaves 5-10 cm. long, narrowed to base; nutlets 2-3 mm. long ..... 3. Hackelia

1. Cynoglossum L. Hound's-tongue, beggar's-lice.
   1. C. virginianum L. Wild comfrey. Fairly common; in open-floored areas of shady mixed woods. 193, 753.

2. Myosotis L. Scorpion-grass, forget-me-not.
   a. Corolla white, 1-2 mm. broad; calyx 2-lipped..... 1. M. verna
   a. Corolla blue, 1.5-4 mm. broad; calyx subequally cleft ..... 2. M. stricta

   1. M. verna Nutt. Occasional; in dry soil of grassy waste areas. 735, 772.
   2. M. stricta Link. Occasional; with low grasses at immediate edge of road; in old roadbed. 657.

3. Hackelia Opiz. Stickseed.
   1. H. virginiana (L.) I.M. Johnston. Occasional; in weedy clearings of pine woods. 168.

83. VERBENACEAE

   a. Plants shrubs; flowers in axillary cymes; fruits showy, rose-pink to purple clustered drupes..... 3. Callicarpa
   a. Plants herbaceous; flowers in spikes; fruits dry, separating into nutlets... b.
      b. Plants erect; inflorescence a slender, sparsely-flowered spike; fruit of four nutlets..... 1. Verbena
      b. Plants procumbent; inflorescence a globose, long-pdeuncled, densely-flowered spike; fruit of two nutlets..... 2. Lippia

1. Verbena L. Vervain.
   1. V. urticifolia L. var. urticifolia. White vervain. Common; along roadsides; in open woods. 147, 187.

2. Lippia L.
   1. L. lanceolata Michx. Fog-fruit. Occasional; in mud of brackish marshes. 50, 132.

3. Callicarpa L.
   1. C. americana L. French mulberry, beauty-berry. Occasional; in moist mixed woods. 166, 309, 478.

84. LABIATAE

   a. Calyx with a protuberance on the upper side, closed in fruit ..... 3. Scutellaria
   a. Calyx without an upper protuberance; open in fruit... b.
      b. Flowers in non-leafy inflorescences... c.
         c. Stamens long-exserted; corolla appearing unilabiate; ovary merely 4-lobed..... 2. Teucrium
         c. Stamens included; corolla bilabiate; ovary deeply 4-parted... d.
            d. Cauline leaves present; inflorescence a dense terminal

spike; anther-bearing stamens 4..... 5. Prunella
d. Cauline leaves nearly absent; inflorescence racemose, the verticels widely separated; anther-bearing stamens 2 ..... 7. Salvia

b. Flowers axillary or in leafy inflorescences... e.
e. Corolla definitely bilabiate... f.
f. Leaves oblong, sessile; stamens long-exserted; ovary merely 4-lobed..... 1. Trichostema
f. Leaves rotund or reniform, the lower petioled; stamens not exserted; ovary deeply 4-parted... g.
g. Flowers pedicelled, 3 in each axil; corolla blue or white..... 4. Glechoma
g. Flowers sessile in verticels of 6-12; corolla red or purplish..... 6. Lamium
e. Corolla nearly regular or weakly 2-lipped, the upper lip flat; fertile stamens unequal, the upper pair shorter... h.
h. Flowers in axillary verticels; corolla limb nearly regular, 4-lobed..... 10. Mentha
h. Flowers not in axillary verticels; corolla zygomorphic..i
i. Inflorescence a terminal thyrse; calyx zygomorphic; stamens ascending under upper corolla-lip. 8. Satureja
i. Inflorescence of axillary cymules; calyx nearly regular; stamens straight..... 9. Pycnanthemum

1. Trichostema L. Bluecurls.
1. T. dichotomum L. Bastard pennyroyal. Rare; in dry sandy soil of clearing in waste area. 383.

2. Teucrium L. Germander.
1. T. canadense L. American germander, wood-sage. Occasional; in thick shrubby growth along road-cuts. 131.

3. Scutellaria L. Skullcap.
a. Median cauline leaves rhombic-ovate, dentate; corolla 1.4-2 cm. long; nutlets about 2 mm. in diameter..... 1. S. elliptica
a. Median cauline leaves linear-lanceolate, entire; corolla 2-2.5 cm. long; nutlets 1.2-1.6 mm. in diameter.....2. S. integrifolia

1. S. elliptica Muhl. Hairy skullcap. Occasional; in deciduous woods. 899.
2. S. integrifolia L. Common; along roadsides; in grassy waysides. 2, 908.

4. Glechoma L. Ground-ivy.
1. G. hederacea L. var. micrantha Moricand. Gill-over-the-ground, run-away-robin. Fairly common; spreading in low areas of woods and along roadsides. 642.

5. Prunella L. Selfheal.
1. P. vulgaris L. Heal-all, carpenter-weed. Fairly common; along weedy roadsides; in old roadbed. 119, 249, 311.

6. Lamium L. Dead-nettle.
1. L. amplexicaule L. Henbit. Rare; in weedy lawn. 638.

7. Salvia L. Sage.
   1. S. lyrata L. Lyre-leaved sage, cancer-weed. Fairly common; in dry ground of roadsides and grassy places. 256, 764.

8. Satureja L. Savory, calamint.
   1. S. calamintha (L.) Scheele var. nepeta (L.) Briq. Occasional; in open sandy ground of waste places and at edge of old field. 174, 185.

9. Pycnanthemum Michx. Mountain-mint, basil.
   1. P. tenuifolium Schrad. Occasional; in low ground of sparsely weedy clearings in pine woods. 296.

10. Mentha L. Mint.
   1. M. arvensis L. Occasional; in low moist ground at edge of pine woods bordering marshes. 328.

85. SOLANACEAE

a. Flowers in corymbs or umbels, rotate, white to pale violet; calyx not inflated; anthers opening by terminal pores..... 1. Solanum
a. Flowers solitary, funnelform, yellow; calyx inflated in fruit; anthers longitudinally dehiscing..... 2. Physalis

1. Solanum L. Nightshade.
   a. Plants annual, without prickles, glabrous or glabrescent; corolla 5-9 mm. wide; berry black, 5-9 mm. in diameter... 1. S. americanum
   a. Plants perennial, prickly, hirsute; corolla about 20 mm. wide; berry yellow, 10-15 mm. in diameter..... 2. S. carolinense

   1. S. americanum Mill. Occasional; in moist ground of low areas of disturbed woods and of mud-flats at shore margin of Spartina marsh. 417, 483.
   2. S. carolinense L. Horse-nettle, ball-nettle. Fairly common; along dry open roadsides. 24.

2. Physalis L. Ground-cherry.
   1. P. heterophylla Nees var. nyctaginea (Dunal) Rydb. Occasional; in clearings of pine woods and of deciduous woods. 392, 795.

86. SCROPHULARIACEAE

a. Median cauline leaves alternate... b.
   b. Plants biennial, with strong basal rosettes; corolla rotate; stamens 5..... 1. Verbascum
   b. Plants annual; corolla bilabiate, basally spurred; stamens 4... c.
      c. Plants prostrate, pubescent; leaves broadly ovate; flowers axillary, solitary; corolla yellow, purple within 2. Kickxia
      c. Plants erect, glabrous; leaves narrowly linear; flowers in terminal racemes; corolla blue..... 3. Linaria
a. Median cauline leaves opposite or whorled... d.

d. Plants woody, trees; inflorescence terminal, paniculate; corolla violet, 5-7 cm. long..... 4. Paulownia
d. Plants herbaceous; inflorescence axillary; corolla to 4 cm. long... e.
e. Corolla rotate; stamens 2..... 6. Veronica
e. Corolla campanulate to funnelform; stamens 4... f.
f. Sepals separate nearly to base; corolla 7-10 mm. long ..... 5. Bacopa
f. Sepals united into a distinct calyx tube; corolla 15-45 mm. long..... 7. Gerardia

1. Verbascum L. Mullein.
a. Plants tomentose, eglandular; leaves decurrent; inflorescence a densely crowded spike..... 1. V. thapsus
a. Plants glandular-pubescent above; leaves sessile, not decurrent; inflorescence a loose raceme..... 2. V. blattaria

1. V. thapsus L. Common mullein, flannel plant. Fairly common; in dry ground of weedy waysides and of waste places. 183.
2. V. blattaria L. Moth mullein. Fairly common; along roadsides; in grassy waysides. 28.

2. Kickxia Dumort.
1. K. elatine (L.) Dumort. Canker-root. Occasional; along open roadsides. 232.

3. Linaria Mill. Toadflax.
1. L. canadensis (L.) Dumont var. texana (Scheele) Pennell. Old-field-toadflax. Fairly common; in dry soil of weedy waysides, of upper beaches and of old cultivated field. 741.

4. Paulownia Sieb.& Zucc.
1. P. tomentosa (Thunb.) Steud. Princess-tree, Karri-tree. Fairly common; persistent near old home sites; escaped in clearings of pine woods. 186.

5. Bacopa Aubl. Water-hyssop.
1. B. acuminata (Walt.) Robins. Rare; in low wet ground of grassy waste area. 295.

6. Veronica L. Speedwell.
a. Plants perennial; inflorescence a terminal raceme, the bracteal leaves reduced; corolla whitish or pale..... 1. V. serpyllifolia
a. Plants annual; inflorescence axillary, the bracteal leaves differing little from the others; corolla blue... b.
b. Pedicels shorter than the unequal sepal lobes, up to 1.5 mm. long..... 2. V. arvensis
b. Pedicels longer than the ovate sepals, greater than 8 mm. long... c.
c. Leaf-blades ovate; sepals short-ciliate; capsules flattened, deeply notched, pubescent..... 3. V. persica
c. Leaf-blades cordate, 3-5-lobed; sepals long-ciliate; capsules turgid, barely notched, glabrous ..... 4. V. hederaefolia

1. V. serpyllifolia L. Thyme-leaved speedwell. Occasional; near edges of mowed lawns. 759.
2. V. arvensis L. Corn-speedwell. Abundant; in open dry ground of roadsides and of waste places. 632, 643, 676.
3. V. persica L. Bird's-eye. Rare; in dry soil of waste places. 767.
4. V. hederaefolia L. Ivy-leaved speedwell. Rare; in thick growth on bank at margin of lawn. 640.

7. Gerardia L. Gerardia.
   a. Corolla yellow; leaves lanceolate, entire to pinnatifid ..... 1. G. virginica
   a. Corolla purple, pink or white; leaves linear, to 4 mm. wide... b.
      b. Leaves to 4 mm. wide; flowers on pedicels 1-4 mm. long; corolla 2-3.8 cm. long; rose-purple or white.... 2. G. purpurea
      b. Leaves filiform, to 1 mm. wide; flowers on pedicels 10-30 mm. long; corolla 1.5-2.5 cm. long, rosy-pink. 3. G. setacea

   1. G. purpurea L.
      forma purpurea. Flowers rose-purple. Common; in moist soil near brackish marshes, in disturbed woods and along grassy waysides. 376, 462, 486.
      forma albiflora Britt. Flowers white. Rare; in moist soil of disturbed woods. 485.
   2. G. setacea (Walt.) J.F. Gmel. Occasional; in open dry ground near roadsides. 378.
   3. G. virginica (L.) BSP. Downy false foxglove. Rare; in open-floored areas of deciduous woods. 793.

87. BIGNONIACEAE

   a. Plants trees; leaves simple, cordate-ovate, pubescent beneath; capsule terete, 20-50 cm. long..... 3. Catalpa
   a. Plants high-climbing shrubs; leaves compound, glabrous; capsule flattened, 10-20 cm. long... b.
      b. Leaflets 9-11, sharply serrate; tendrils none..... 1. Campsis
      b. Leaflets 2, entire; leaves with terminal branched tendril ..... 2. Bignonia

1. Campsis Lour. Trumpet-flower.
   1. C. radicans (L.) Seem. Trumpet-creeper, cow-itch. Abundant; high-climbing in pine woods; twined in Myrica cerifera along road-cuts; in waste places. 31, 160.

2. Bignonia L.
   1. B. capreolata L. Cross-vine. Occasional; high-climbing in pine woods and in mixed woods. 787, 876.

3. Catalpa Scop. Catalpa, catawba, Indian bean.
   1. C. speciosa Warder. Catawba-tree, cigar-tree. Rare; persistent in vicinity of old home site. 182, 387.

88. ACANTHACEAE

a. Leaves linear to lanceolate, subsessile; flowers in long-peduncled heads; corolla pale violet to white, 2-lipped; stamens 2..... 1. Justicia
a. Leaves lanceolate to ovate, petioled; flower-clusters subsessile; corolla lavender, funnelform; stamens 4.... 2. Ruellia

1. Justicia L. Water-willow.
   1. J. americana (L.) Vahl. Rare; in shallow water of small sandy cove off Back River. 874.

2. Ruellia L. Ruellia.
   1. R. caroliniensis (Walt.) Steud. Fairly common; at edges of dry pine woods bordering roadsides. 66, 82.

89. PLANTAGINACEAE

1. Plantago L. Plantain, ribwort.
   a. Leaves lanceolate to broadly ovate, the blades glabrous or slightly hirtellous; bracts and sepals glabrous... b.
      b. Leaves broadly elliptic to ovate; spikes slender, interrupted; bracts and sepals keeled; corolla lobes less than 1 mm. long ..... 1. P. rugelii
      b. Leaves lanceolate; spikes dense; bracts and sepals rounded on back; corolla lobes more than 1 mm. long... 2. P. lanceolata
   a. Leaves oblanceolate to linear, the blades pubescent; bracts and/or sepals hirsute... c.
      c. Bracts of spike several times longer than flowers; leaves linear, dark green; corolla-lobes reflexed..... 3. P. aristata
      c. Bracts mostly shorter than calyx; leaves oblanceolate, gray-villous; corolla-lobes erect..... 4. P. virginica

   1. P. rugelii Dcne. Pale plantain. Common; along open roadsides. 134, 239.
   2. P. lanceolata L. Ribgrass, English plantain. Abundant; along roadsides; in weedy waysides. 32, 122, 255.
   3. P. aristata Michx. Bracted plantain. Occasional; in dry soil of roadsides. 30.
   4. P. virginica L. Hoary plantain, pale-seed plantain. Fairly common; along roadsides; in grassy waysides. 647.

90. RUBIACEAE

a. Plants woody, shrubs or small trees; flowers dense, in large terminal globose pedunculate heads..... 5. Cephalanthus
a. Plants herbaceous; flowers not in dense globose heads... b.
   b. Leaves in whorls of 4 or more... c.
      c. Flowers in involucrate heads; corolla funnelform, blue or pink; sepals triangular.....1. Sherardia
      c. Flowers cymose; involucre absent; corolla rotate, white or greenish-white; sepals obsolete..... 2. Galium

b. Leaves opposite... d.
d. Stems trailing; leaves round-ovate, shiny, evergreen; corolla white, bearded inside; fruit a red berry-like double drupe..... 4. Mitchella
d. Stems ascending; leaves elongate, deciduous; corolla not bearded; fruit a dehiscent capsule... e.
e. Flowers axillary, sessile, whitish; stipules fringed with bristles..... 3. Diodia
e. Flowers terminal, pedunculate, blue with a yellow eye; stipules without bristles..... 6. Houstonia

1. Sherardia L. Field-madder.
1. S. arvensis L. Rare; in dry seldom-mowed lawn. 768.

2. Galium L. Bedstraw, cleavers.
a. Ovary and fruit covered with hooked hairs... b.
b. Principal stem leaves in whorls of 4; stems stiff, erect or ascending, pilose..... 3. G. pilosum
b. Principal stem leaves in whorls of 6 or 8; stems weak or reclining, glabrous or scabrous... c.
c. Plants annual; stems retrorsely bristly; leaves linear-oblanceolate, mostly in whorls of 8..... 1. G. aparine
c. Plants perennial; stems glabrous; leaves narrowly elliptic, mostly in whorls of 6..... 3. G. triflorum
a. Ovary and fruit glabrous, smooth... d.
d. Stems retrorse-scabrous; leaves oblanceolate, deciduous, in 5's or 6's; fruits dry, about 1.5 mm. across.. 4. G. tinctorium
d. Stems glabrous; leaves linear, evergreen; fruits succulent, 2-4 mm. in diameter..... 5. G. uniflorum

1. G. aparine L. Cleavers, goosegrass. Common; in clearings of deciduous woods; in weedy waysides. 695, 705, 828.
2. G. triflorum Michx. Sweet-scented bedstraw. Fairly common; in mixed woods; in disturbed woods; along grassy waysides. 280.
3. G. pilosum Ait. var. puncticulosum (Michx.) T.& G. Hairy bedstraw. Occasional; in dry soil of disturbed woods. 192.
4. G. tinctorium L. Fairly common; in moist soil of grassy waysides, of a low meadow and of mud-flats of brackish marshes. 37, 47.
5. G. uniflorum Michx. Occasional; in moist pine woods. 190.

3. Diodia L. Buttonweed.
a. Corolla salverform, 10 mm. long; sepals 2; fruit ellipsoid, ribbed, 7-10 mm. long..... 1. D. virginiana
a. Corolla funnelform, 4-6 mm. long; sepals 4; fruit obovoid, not ribbed, 3-5 mm. long..... 2. D. teres

1. D. virginiana L. Fairly common; along roadsides, especially in gullies. 36, 83, 194.
2. D. teres Walt. Occasional; in open dry sandy ground near old cultivated field. 173, 384.

4. Mitchella L. Partridge-berry.
1. M. repens L. Two-eyed-berry, running box. Abundant; in moist

pine woods and in mixed woods. 455, 539, 827.

5. Cephalanthus L. Buttonbush.
   1. C. occidentalis L. Occasional; in wet ground of low marshy area and of sandy shores of the James River. 402, 523.

6. Houstonia L.
   1. H. caerulea L. Bluets, innocence, Quaker-ladies. Common; in clearings of pine woods and mixed woods; in grassy waysides. 630, 650, 691.

91. CAPRIFOLIACEAE

a. Plants pubescent climbing shrubs; flowers axillary, in pairs; corolla tubular, 3-4 cm. long..... 1. Lonicera
a. Plants subglabrous erect shrubs or small trees; flowers in terminal cymes; corolla rotate to open-campanulate... b.
b. Leaves simple; fruit a 1-seeded drupe..... 2. Viburnum
b. Leaves pinnately compound; fruit a 3-seeded berry.. 3. Sambucus

1. Lonicera L. Honeysuckle.
   1. L. japonica Thunb. Japanese honeysuckle. Abundant; high-climbing in pine woods; twining in Myrica cerifera; in thickets. 27, 71, 470.

2. Viburnum L. Viburnum, arrow-wood.
   1. V. prunifolium L. Black-haw, stagbush. Fairly common; in low ground of mixed woods; along bank above Back River. 706.

3. Sambucus L. Elder.
   1. S. canadensis L. Common elder. Rare; in moist soil at margin of brackish marsh. 9, 90.

92. VALERIANACEAE

1. Valerianella Mill. Corn-salad, lamb's-lettuce.
a. Corolla bluish; stamens included or barely exserted; fertile cell of fruit with a turgid corky back..... 1. V. olitoria
a. Corolla white; stamens well exserted; fertile cell of fruit without corky thickening..... 2. V. radiata

   1. V. olitoria (L.) Poll. Corn-salad, lamb's-lettuce. Fairly common; in waste places; along open roadsides; in old roadbed. 721, 730, 769.
   2. V. radiata (L.) Dufr. Rare; in overgrown old roadbed. 731.

93. CUCURBITACEAE

1. Melothria L. Melonette.
   1. M. pendula L. Fairly common; climbing in Myrica cerifera and young saplings along road-cuts; in pine woods. 154, 473.

94. CAMPANULACEAE

a. Corolla subrotate, deeply 5-lobed; stamens distinct 1. Specularia
a. Corolla irregular, gamopetalous, somewhat bilabiate; stamens united into a tube..... 2. Lobelia

1. Specularia Fabricius. Venus's looking-glass.
   1. S. perfoliata (L.) A. DC. Common; in dry ground of roadsides and of waste places. 22.

2. Lobelia L. Lobelia.
   a. Corolla scarlet or deep red, 3-4.5 cm. long..... 1. L. cardinalis
   a. Corolla purple to blue, to 2.4 cm. long... b.
      b. Corolla-tube fenestrate; corolla 1.5-2.4 cm. long; capsule not inflated..... 2. L. puberula
      b. Corolla-tube not fenestrate; corolla 0.7-1.0 cm. long; capsule becoming inflated..... 3. L. inflata

   1. L. cardinalis L. Cardinal-flower. Rare; in moist soil of pond bank. 247.
   2. L. puberula Michx. Occasional; in low areas of roadside ditches and of trench in mixed woods. 368, 528.
   3. L. inflata L. Indian-tobacco. Common; in open dry ground of roadsides. 165, 229, 253.

95. COMPOSITAE

a. Ligulate flowers absent, heads discoid... b.
   b. Receptacle naked... c.
      c. Plants woody shrubs 1-3 m. high; dioecious.... 10. Baccharis
      c. Plants herbaceous... d.
         d. Flowers all perfect... e.
            e. Flowers bright yellow..... 27. Senecio
            e. Flowers white, pink or purple... f.
               f. Pappus double, of scale-like and capillary bristles; heads 30-50-flowered..... 1. Vernonia
               f. Pappus simple; heads 2-30-flowered... g.
                  g. Plants climbing vines; leaves cordate 4. Mikania
                  g. Plants erect; leaves not cordate... h.
                     h. Heads in glomerules, subtended by foliaceous bracts..... 2. Elephantopus
                     h. Heads not glomerulate... i.
                        i. Achenes 5-angled; inflorescence a corymb..... 3. Eupatorium
                        i. Achenes 10-ribbed; inflorescence a spike or spiciform..... 5. Liatris
         d. Outer flowers pistillate, or heads unisexual... j.
            j. Plants white-wooly, at least on lower surfaces of leaves... k.
               k. Plants dioecious; leaves in basal rosettes; pappus of staminate heads clavate..... 12. Antennaria
               k. Plants monoecious, not rosulate-leaved; pappus of distinct capillary bristles..... 13. Gnaphalium
            j. Plants glabrous to puberulent, not white-woolly... l.
               l. Involucre 4-7 mm. high, its bracts uniseriate; heads pinkish..... 11. Pluchea

l. Involucre 10-15 mm. high, its bracts imbricate in several series; heads whitish..... 26. Erechtites

b. Receptacle bristly or chaffy... m.
m. Pappus present, of awns or bristles... n.
n. Pappus of awns; leaves opposite, not spiny; involucral bracts herbaceous..... 20. Bidens
n. Pappus of capillary bristles; leaves alternate, spiny; involucral bracts spine-tipped..... 28. Cirsium
m. Pappus absent... o.
o. Plants shrubby at base; staminate and pistillate flowers in the same head; involucre of roundish phyllaries, not prickly..... 14. Iva
o. Plants herbaceous; staminate and pistillate flowers in separate heads; involucre of pistillate heads prickly.. p
p. Leaves 1-2 pinnatifid; involucre of pistillate heads nut-like, with several short spines..... 15. Ambrosia
p. Leaves simple; involucre of pistillate heads a bur with numerous hooked prickles..... 16. Xanthium

a. Ligulate flowers present... q.
q. Heads radiate, ligulate flowers (rays) at periphery, imperfect... r.
r. Rays white to cream-color, pinkish or lavender... s.
s. Pappus of capillary bristles... t.
t. Inflorescence a terminal spike-like panicle; heads small, the disks to 5 mm. wide; rays to 4 mm. long ..... 7. Solidago
t. Inflorescence various, not as above; heads and rays various... u.
u. Heads mostly on leafy branchlets; phyllaries unequal, imbricated in several series..... 8. Aster
u. Heads on naked peduncles or scapes; phyllaries uniseriate..... 9. Erigeron
s. Pappus a minute crown or none... v.
v. Receptacle naked; heads 4-6 cm. wide 24. Chrysanthemum
v. Receptacle chaffy; heads smaller... w.
w. Leaves opposite; heads 1-3 in terminal or axillary clusters..... 18. Eclipta
w. Leaves alternate; heads many in a cluster or solitary... x.
x. Heads small, densely corymbed; ligules 1.5-2.5 mm. long..... 22. Achillea
x. Heads relatively large, solitary at tips of branchlets; ligules 6-12 mm. long.. 23. Anthemis
r. Rays yellow or orange... y.
y. Receptacle chaffy; pappus of awns or none... z.
z. Pappus absent; disk-flowers sterile..... 17. Polymnia
z. Pappus of awns; disk-flowers fertile... a.
a. Plants with winged stems; involucral bracts subequal, slightly imbricate..... 19. Verbesina
a. Plants without wings on stems; involucral bracts biseriate, dimorphic..... 20. Bidens
y. Receptacle naked; pappus of scales and/or bristles... b.
b. Pappus of scales or of scales and bristles... c.

c. Pappus double, the inner of bristles, the outer of scales..... 6. Chrysopsis
c. Pappus of awn-tipped scales only..... 21. Helenium
b. Pappus of capillary bristles... d.
d. Leaves opposite, mostly basal..... 25. Arnica
d. Leaves alternate... e.
e. Involucral bracts unequal, in several series ..... 7. Solidago
e. Involucral bracts equal, uniseriate..27. Senecio
q. Heads ligulate, of ligulate flowers only... f.
f. Pappus chaffy or of both chaff and bristles... g.
g. Corolla blue to rose; involucre double; pappus of narrow scales only..... 29. Cichorium
g. Corolla yellow; involucre simple; pappus of both scales and bristles..... 30. Krigia
f. Pappus entirely of capillary bristles... h.
h. Pappus-bristles plumose..... 31. Hypochoeris
h. Pappus-bristles smooth, scabrous or barbellate... i.
i. Achenes beaked... j.
j. Plants scapose, the scapes hollow; achenes spinulose above..... 32. Taraxacum
j. Plants leafy-stemmed; achenes not spinulose above... k.
k. Heads panicled; achenes flattened; pappus white..... 34. Lactuca
k. Heads solitary or few; achenes columnar, ribbed; pappus reddish or brownish ..... 35. Pyrrhopappus
i. Achenes beakless... l.
l. Plants glabrous; leaves pinnatifid, clasping; achenes flattened..... 33. Sonchus
l. Plants more or less pubescent; leaves entire or dentate; achenes columnar..... 36. Hieracium

1. Vernonia Schreb. Ironweed.
1. V. noveboracensis (L.) Michx. var. noveboracensis. Swamp ironweed. Rare; in low soggy ground adjacent to brackish marsh. 340.

2. Elephantopus L. Elephant's-foot.
a. Definite basal rosette not present; stems leafy 1. E. carolinianus
a. Definite basal rosette present; stems scapose or subscapose, the cauline leaves reduced..... 2. E. tomentosus

1. E. carolinianus Willd. Occasional; in weedy clearings of disturbed mixed woods. 431.
2. E. tomentosus L. Devil's-grandmother, tobaccoweed. Common; in open mixed woods. 334.

3. Eupatorium L. Thoroughwort.
a. Flowers 3-7 in each head... b.
b. Plants annual; leaves dissected into capillary divisions; heads numerous in a compound panicle..... 1. E. capillifolium
b. Plants perennial; leaves elliptic to subelliptic, veiny;

inflorescence a corymb..... 2. E. album
a. Flowers 9-70 in each head... c.
c. Flowers bluish or purple; receptacle conical; plant stoloniferous..... 6. E. coelestinum
c. Flowers white; receptacle flat; plant non-stoloniferous... d.
d. Leaves cinereous-scabrous; involucre 2-3-seriate, imbricate; backs of corolla-lobes glabrous..... 3. E. serotinum
d. Leaves scarcely cinereous; involucre essentially 1-seriate; backs of corolla-lobes hairy... e.
e. Leaves serrate, acuminate, on elongate petioles; corollas 3-4 mm. long..... 4. E. rugosum
e. Leaves crenate, acute or obtuse, on short petioles; corollas 4-6 mm. long..... 5. E. aromaticum

1. E. capillifolium (Lam.) Small. Dog-fennel. Fairly common; in weedy clearings; in old overgrown field. 439, 477.
2. E. album L. Occasional; in open dry ground of roadsides. 199, 290.
3. E. serotinum Michx. Rare; in moist soil of weedy area at margin of brackish marsh. 409.
4. E. rugosum Houtt. White snakeroot. Occasional; in dry soil of open mixed woods. 509, 536.
5. E. aromaticum L. Fairly common; in mixed woods. 540.
6. E. coelestinum L. Mistflower, blue boneset. Fairly common; in weedy waysides. 273, 363.

4. Mikania Willd. Climbing hempweed.
1. M. scandens (L.) Willd. Fairly common; in wet soil of brackish marshes, often twining in marsh grasses. 150, 246, 426.

5. Liatris Schreb. Button-snakeroot, blazing-star.
1. L. graminifolia (Walt.) Willd. Rare; along path in moist pine woods. 501.

6. Chrysopsis Ell. Golden aster.
a. Lower leaves linear, parallel-nerved, silvery; heads terminal, campanulate..... 1. C. graminifolia
a. Lower leaves spatulate to narrowly obovate, netted-veined, becoming green and glabrate; heads in a corymb, hemispherical ..... 2. C. mariana

1. C. graminifolia (Michx.) Ell. Silkgrass. Occasional; in dry soil of grassy waysides. 348.
2. C. mariana (L.) Ell. Fairly common; in dry soil of clearings in mixed woods. 367, 503, 561.

7. Solidago L. Goldenrod.
a. Inflorescence a compound corymb with a flattish top... b.
b. Leaves 3-nerved, punctate, (2-)4-12 mm. wide; axillary fascicles not present; heads 12-45-flowered 7. S. graminifolia
b. Leaves 1-nerved, folded or almost bristle-like, 1-2.5 mm. wide; leafy axillary fascicles present; heads 9-18-flowered ..... 8. S. microcephala
a. Inflorescence various, but not corymbiform or subcapitate... c.

c. Inflorescence a thyrsoid or spike-like panicle; rays whitish to cream-color..... 1. S. bicolor
c. Inflorescence paniculiform, nodding at summit and/or with recurved-secund branches; rays yellow to orange... d.
d. Basal leaves largest, persistent; cauline leaves decreasing rapidly in size... e.
e. Leaves fleshy, entire, smooth; heads 20-50-flowered; pappus 3.5-5.5 mm. long..... 2. S. sempervirens
e. Leaves not fleshy, the basal serrate; heads 15-22-flowered; pappus 2-3.3 mm. long... f.
f. Leaves glabrous, triple-nerved, the basal 7-20 mm. wide; rays 3-6; achenes glabrous..... 3. S. pinetorum
f. Leaf-margins ciliate-scabrous; leaves not triple-nerved, the basal 20-75 mm. wide; rays 7-12; achenes pubescent..... 4. S. juncea
d. Basal leaves not larger, deciduous; cauline leaves subequal, approximate... g.
g. Leaves loosely veiny, not triple-nerved; phyllaries green to stramineous..... 5. S. rugosa
g. Leaves triple-nerved; phyllaries keeled, pale, scarious-herbaceous..... 6. S. altissima

1. S. bicolor L. White goldenrod, silverrod. Occasional; in dry soil of road-cuts through pine woods. 351, 377.
2. S. sempervirens L. Seaside goldenrod. Fairly common; in moist sandy soil of shores of James River and adjacent to brackish marshes. 404, 490.
3. S. pinetorum Small. Early goldenrod. Common; in dry soil of open roadsides; at edges of pine woods. 207, 271, 286.
4. S. juncea Ait. Occasional; in dry soil of grassy waysides. 208.
5. S. rugosa Ait.
   var. aspera (Ait.) Fern. Panicle pyramidal, its branches usually floriferous throughout; involucre 3-4 mm. high, its phyllaries firm. Occasional; in low ground of often-flooded meadow. 374.
   var. celtidifolia (Small) Fern. Panicle very lax, its branches floriferous chiefly above the middle; involucre 3.5-5.5 mm. high, its phyllaries often membranaceous. Occasional; in moist soil of open pine woods. 433.
6. S. altissima L. Occasional; along open dry roadsides. 479.
7. S. graminifolia (L.) Salisb. var. nuttallii (Greene) Fern. Fairly common; in moist soil of low ground of disturbed areas and of edge of brackish marshes. 463, 476, 480.
8. S. microcephala (Greene) Bush. Rare; in weedy area along edge of brackish marsh. 465.

8. Aster L. Aster, starwort, frost-flower.
a. Plants annual; heads 5-7 mm. high; ligules only slightly exserted ..... 4. A. subulatus
a. Plants perennial; ligules conspicuous... b.
b. Leaves fleshy; inflorescence corymbose; phyllaries without herbaceous tips..... 3. A. tenuifolius

b. Leaves not fleshy; inflorescence paniculate to racemose or virgate; phyllaries with herbaceous tips... c.
c. Involucral bracts firm, coriaceous below, subulate, sharp-pointed..... 1. A. pilosus
c. Involucral bracts pliable, foliaceous, acute, not sharp-pointed..... 2. A. dumosus

1. A. pilosus Willd. var. pilosus. Field aster.
forma pilosus. Ligules white. Occasional; in dry soil of grassy waysides and of road-cuts through pine woods. 454.
forma pulchellus Benke. Ligules roseate. Rare; in soggy ground at edge of brackish marsh. 511.
2. A. dumosus L. Occasional; in moist soil adjacent to brackish marsh. 364.
3. A. tenuifolius L. Occasional; at high-tide line along shores of the James River. 491.
4. A. subulatus Michx. var. euroaster Fern.& Grisc. Occasional; in moist sandy soil along shores of the James River. 410, 495.

9. Erigeron L. Fleabane.
a. Ligules minute, shorter than pappus; disks 1-4 mm. broad ..... 4. E. canadensis
a. Ligules conspicuous, exceeding pappus; disks 3-20 mm. broad... b.
b. Plants perennial; cauline leaves clasping; pappus of ray flowers of long bristles; disk-corollas 2.5-4.5 mm. long ..... 1. E. philadelphicus
b. Plants annual or biennial; cauline leaves not clasping; pappus of ray flowers of bristles less than 1 mm. long; disk-corollas 1.5-2.5 mm. long... c.
c. Foliage ample; cauline leaves membranaceous, coarsely toothed or cleft..... 2. E. annuus
c. Foliage sparse; cauline leaves firmer, entire ..... 3. E. strigosus

1. E. philadelphicus L. Rare; along grassy waysides. 817.
2. E. annuus (L.) Pers. Daisy-fleabane, white-top. Fairly common; along open roadsides. 38, 907.
3. E. strigosus Muhl. Daisy-fleabane, white-top. Common; along open dry roadsides; in grassy waysides. 69, 222, 906.
4. E. canadensis L. Horse-weed, hog-weed. Occasional; along open dry roadsides. 243.

10. Baccharis L. Groundsel-tree.
1. B. halimifolia L. Sea myrtle. Common; in moist to wet soil in wet woods and along brackish marshes. 370, 450.

11. Pluchea Cass. Marsh-fleabane, stinkweed.
a. Leaves sessile, somewhat cordate-clasping; flowers creamy ..... 1. P. foetida
a. Leaves petioled or tapering to base; flowers pink or purple... b.
b. Leaves subsessile; inflorescence a flat-topped corymb; phyllaries glandular-pubescent on back..... 2. P. purpurascens
b. Leaves petioled; inflorescence a round-topped corymbiform

panicle; phyllaries glabrous or granular..... 3. P. camphorata

1. P. foetida (L.) DC. Stinking fleabane. Fairly common; in wet ground of low often-flooded meadow and of margins of brackish marshes. 277.
2. P. purpurascens (Sw.) DC. var. purpurascens. Occasional; in low soggy ground adjacent to brackish marshes. 317.
3. P. camphorata (L.) DC. Camphorweed, stinkweed. Occasional; in moist places of mixed woods. 397.

12. Antennaria Gaertn. Everlasting, pussy's-toes.
   a. Summit of stem purple-glandular; rosette-leaves glabrous or glabrate; central corollas 4.5-7 mm. long; pappus 7.5-8.5 mm. long ..... 1. A. parlinii
   a. Stem eglandular; rosette leaves minutely canescent; central corollas 2.5-4.3 mm. long; pappus 4-5.5 mm. long ..... 2. A. plantaginifolia

1. A. parlinii Fern. Fairly common; in open dry ground of clearings in mixed woods and of roadside banks. 702, 732.
2. A. plantaginifolia (L.) Hook. Fairly common; in clearings of mixed woods. 652, 689, 745.

13. Gnaphalium L. Cudweed, everlasting.
1. G. purpureum L. Purple cudweed. Common; along open dry roadsides. 45, 231, 713.

14. Iva L. Marsh-elder.
1. I. frutescens L. Occasional; in moist soil of low ground along margins of brackish marshes. 329.

15. Ambrosia L. Ragweed.
1. A. artemisiifolia L. Common ragweed. Occasional; in dry soil of roadsides and of waste places. 386.

16. Xanthium L. Cocklebur, clotbur.
1. X. strumarium L. Occasional; in waste places; in sandy soil of upper beaches of the James River. 401, 408.

17. Polymnia L. Leafcup.
1. P. uvedalia L. Bearsfoot. Occasional; in moist soil at edge of woods along road-cuts and in weedy clearings. 327, 400.

18. Eclipta L.
1. E. alba (L.) Hassk. Rare; in moist soil of weedy area bordering brackish marsh. 423.

19. Verbesina L. Crown-beard.
1. V. occidentalis (L.) Walt. Abundant; forming large dense colonies in pine woods, spreading from borders and in clearings. 163, 219, 430.

20. Bidens L. Bur-marigold.
   a. Ligules golden-yellow, wide-spreading, showy, 1.2-3 cm. long... b.

b. Leaves simple, sessile; chaff reddish-tipped; outer achenes 6-8 mm. long, with awns 2.8-4.5 mm. long..... 1. B. laevis
b. Leaves 3-7-divided or undivided, short-petioled; chaff black-tipped; outer achenes 3-6 mm. long, with awns 0.4-2.6 mm. long ..... 4. B. coronata

a. Ligules wanting or shorter than outer involucre... c.
c. Leaves 2-3 times pinnately divided; achenes linear, attenuate above..... 5. B. bipinnata
c. Leaves with 3-5 petiolulate uncleft leaflets; achenes broadened from base to summit... d.
d. Outer involucral bracts 5-8, ciliate; awns usually retrorsely barbed, the outer 2-4 mm. long.... 2. B. frondosa
d. Outer involucral bracts 3-5, eciliate; awns antrorsely barbed, the outer 1-1.5 mm. long..... 3. B. discoidea

1. B. laevis (L.) BSP. Fairly common; in wet soil of brackish marshes and of sandy shores of the James River. 319, 496, 589.
2. B. frondosa L. Beggar-ticks, stick-tight. Occasional; in moist soil bordering brackish marshes. 422.
3. B. discoidea (T.& G.) Britt. Rare; along sandy shores of the James River (this collection from rotting driftwood). 421.
4. B. coronata (L.) Britt. Tickseed-sunflower. Occasional; in low soggy ground adjacent to brackish marshes; in ditch along old roadbed. 379, 554.
5. B. bipinnata L. Spanish-needles. Occasional; in waste places; in weedy waysides. 428.

21. Helenium L. Sneezeweed.
1. H. autumnale L. Rare; along path through moist pine woods. 333, 500.

22. Achillea L. Yarrow.
1. A. millefolium L. Common yarrow, milfoil. Common; in grassy waysides; along edges of old cultivated field. 6, 179, 904.

23. Anthemis L. Chamomile.
1. A. arvensis L. Corn-chamomile. Rare; in sandy soil of weedy, seldom-mowed lawn. 882.

24. Chrysanthemum L. Chrysanthemum.
1. C. leucanthemum L. var. pinnatifidum Lecoq.& Lamotte. Ox-eye-daisy, Marguerite. Common; along open roadsides; in grassy waysides. 17, 62, 522.

25. Arnica L. Arnica.
1. A. acaulis (Walt.) BSP. Leopard's-bane. Occasional; in grassy waysides. 88, 755.

26. Erechtites Raf. Fireweed.
1. E. hieracifolia (L.) Raf. Pilewort. Occasional; in clearings of moist pine woods. 297.

27. Senecio L. Groundsel, ragwort.
a. Plants persistently tomentose; cauline leaves scarcely pinnatifid

entire or toothed..... 1. S. tomentosus
a. Plants glabrous or with deciduous tomentum; cauline leaves pinnatifid... b.
b. Basal leaves elliptic-oblanceolate; achenes hispidulous ..... 2. S. smallii
b. Basal leaves ovate, cordate; achenes glabrous..... 3. S. aureus

1. S. tomentosus Michx. Rare; in grassy waysides. 774.
2. S. smallii Britt. Fairly common; along open roadsides; in grassy waysides. 792, 829.
3. S. aureus L. Golden ragwort, squaw-weed. Common; forming extensive colonies in disturbed places in woods. 671, 704.

28. Cirsium Mill. Common thistle, plumed thistle.
a. Stems prickly-winged by decurrent leaf-bases; heads not subtended by leafy bracts; all involucral bracts prickle-tipped ..... 1. C. vulgare
a. Stems not long-winged; heads subtended by spinescent leafy bracts; at least the inner involucral bracts not prickle-tipped..b
b. Involucre 3-5 cm. high; all phyllaries with weak flat tips; flowers yellow, the anthers red..... 2. C. horridulum
b. Involucre 2.5-3 cm. high; outer phyllaries prickle-tipped; flowers purple or white..... 3. C. discolor

1. C. vulgare (Savi) Tenore. Bull thistle, common thistle. Fairly common; in dry soil of waste places and along open roadsides. 294.
2. C. horridulum Michx. Yellow thistle. Common; along grassy waysides; in low ground at margins of brackish marshes. 4, 888.
3. C. discolor (Muhl.) Spreng.
forma discolor. Flowers purple. Occasional; in low ground of woods. 434.
forma albiflorum (Britt.) House. Flowers white. Rare; in low ground adjacent to brackish marsh. 469.

29. Cichorium L. Succory, chicory.
1. C. intybus L. Common chicory, blue sailors. Common; along open roadsides. 127, 215.

30. Krigia Schreb. Dwarf dandelion.
a. Plants annual; involucre 3.5-7 mm. high; pappus bristles 5-7 ..... 1. K. virginica
a. Plants perennial, the roots tuberiferous; involucre 7-14 mm. high; pappus bristles 15-20..... 2. K. dandelion

1. K. virginica (L.) Willd. Common; along open dry roadsides. 79, 725.
2. K. dandelion (L.) Nutt. Potato-dandelion. Common; in grassy waysides; along woodland borders. 736, 752, 765.

31. Hypochoeris L. cat's-ear.
1. H. radicata L. Common; in weedy seldom-mowed lawn; in grassy waysides. 87, 124, 872.

32. Taraxacum Zinn. Dandelion.
    1. T. officinale Weber. Common dandelion. Fairly common; in grassy waysides; in weedy lawn. 291, 521.

33. Sonchus L. Sow-thistle, milk-thistle.
    1. S. asper (L.) Hill. Spiny-leaved sow-thistle. Occasional; along open roadsides. 798.

34. Lactuca L. Lettuce.
    1. L. canadensis L. Fairly common; along grassy waysides. 214, 259.

35. Pyrrhopappus DC. False dandelion.
    1. P. carolinianus (Walt.) DC. Common; along open dry roadsides; in grassy waysides. 86, 135, 242.

36. Hieracium L. Hawkweed.
    a. Stem subscapose, soft; basal leaves narrowly oblanceolate; inflorescence a compact flat-topped corymb; achenes 1.5-2 mm. long..... 1. H. pratense
    a. Stem firm; basal leaves broadly oblanceolate to elliptic; inflorescence a diverse panicle; achenes 2-2.4 mm. long... b.
        b. Lower part of stem subglabrous; basal leaves usually purple-veined or mottled; inflorescence an open corymbiform panicle ..... 2. H. venosum
        b. Lower part of stem villous; leaves not purple-veined; inflorescence a virgate thyrsiform cylindric panicle ..... 3. H. gronovii

    1. H. pratense Tausch. King devil. Rare; in grassy wayside. 782.
    2. H. venosum L. Rattlesnake-weed. Poor Robin's plantain. Common; in dry soil along woodland borders; in clearings in woods. 212, 353, 567, 898.
    3. H. gronovii L. Hairy hawkweed. Occasional; along grassy waysides. 257.

Check List of the Vascular Plants of Jamestown Island
James City County, Virginia

* record for James City County.

** record for The Peninsula.

*** record for Virginia.

a unpublished record of Barans (1969).

Check List of the Vascular Plants of Jamestown Island
James City County, Virginia

Lycopodiaceae
Lycopodium complanatum L. var. flabelliforme Fern.

Ophioglossaceae
Botrychium virginianum (L.) Sw.
Ophioglossum vulgatum L. var. pycnostichum Fern.

Osmundaceae
Osmunda regalis L. var. spectabilis (Willd.) Gray
O. cinnamomea L.

Polypodiaceae
Onoclea sensibilis L.
Dryopteris thelypteris (L.) Gray var. pubescens (Lawson) Nakai
D. noveboracensis (L.) Gray
D. hexagonoptera (Michx.) Christens.
D. spinulosa (O.F. Muell.) Watt
** D. celsa (Wm. Palmer) Small
Polystichum acrostichoides (Michx.) Schott
Dennstaedtia punctilobula (Michx.) Moore
**a Athyrium filix-femina (L.) Roth
Asplenium platyneuron (L.) Oakes
Woodwardia virginica (L.) Sm.
W. areolata (L.) Moore
Pteridium aquilinum (L.) Kuhn var. latiusculum (Desv.) Underw.

Salviniaceae
* Azolla caroliniana Willd.

Pinaceae
Pinus taeda L.
P. virginiana Mill.
Taxodium distichum (L.) Richard
Juniperus virginiana L.

Typhaceae
Typha latifolia L.
T. angustifolia L.

Alismataceae
Sagittaria falcata Pursh

Gramineae

Arundinaria gigantea (Walt.) Chapm.
Bromus commutatus Schrad.
Festuca elatior L.
Vulpia myuros (L.) K.C. Gmel.
Poa annua L.
P. compressa L.
**a *P. pratensis* L.
Dactylis glomerata L.
**a *Eragrostis spectabilis* (Pursh) Steud.
Uniola laxa (L.) BSP.
Triodia flava (L.) Smyth
Lolium perenne L. var. *perenne*
Hordeum pusillum Nutt.
Elymus virginicus L.
Holcus lanatus L.
Sphenopholis obtusata (Michx.) Scribn.
Aira elegans Willd.
Danthonia spicata (L.) Beauv. var. *spicata*
Agrostis hyemalis (Walt.) BSP.
A. perennans (Walt.) Tuckerm.
Cinna arundinacea L.
Spartina cynosuroides (L.) Roth
S. alterniflora Loisel.
Cynodon dactylon (L.) Pers.
Anthoxanthum odoratum L.
Zizania aquatica L.
Paspalum floridanum Michx.
P. dilatatum Poir.
Panicum amarum Ell.
P. anceps Michx.
P. laxiflorum Lam.
P. microcarpon Muhl.
P. nitidum Lam.
P. lanuginosum Ell.
P. sphaerocarpon Ell.
P. polyanthes Schultes
P. scoparium Lam.
P. clandestinum L.
* *Sacciolepis striata* (L.) Nash
Echinochloa pungens (Poir.) Rydb.
E. walteri (Pursh) Nash
Setaria glauca (L.) Beauv.
** *S. viridis* (L.) Beauv.
* *Cenchrus tribuloides* L.
Erianthus giganteus (Walt.) Muhl.
* *Arthraxon hispidus* (Thunb.) Makino var. *cryptatherus* (Hack.) Houda
Andropogon scoparius Michx.
A. virginicus L.
Tripsacum dactyloides L.

Cyperaceae

**a *Cyperus dipsaciformis* Fern.

** Cyperus grayii Torr.
C. ovularis (Michx.) Torr.
C. retrorsus Chapm.
Eleocharis engelmanni Steud.
** E. ambigens Fern.
Scirpus americanus Pers.
S. validus Vahl var. creber Fern.
* S. robustus Pursh
S. rubricosus Fern.
* Rhynchospora corniculata (Lam.) Gray
** Carex retroflexa Muhl.
**a C. vulpinoidea Michx.
** C. annectens Bickn.
**a C. longii Mackenz.
C. alata T.& G.
** C. complanata Torr.& Hook.
** C. swanii (Fern.) Mackenz.
** C. blanda Dew.
** C. typhina Michx.
** C. lacustris Willd.
C. comosa Boott
C. lurida Wahlenb.
** C. grayii Carey var. hispidula Gray

Araceae
Arisaema triphyllum (L.) Schott
Peltandra virginica (L.) Schott & Endl.

Lemnaceae
Spirodela polyrhiza (L.) Schleid.
**a Lemna minor L.
**a Wolffia papulifera C.H. Thompson

Commelinaceae
**a Commelina communis L.
* Aneilema keisak Hassk.

Pontederiaceae
Pontederia cordata L.

Juncaceae
Juncus bufonius L.
J. tenuis Willd. var. tenuis
**a J. coriaceus Mackenz.
J. effusus L.
** J. biflorus Ell.
J. acuminatus Michx.
Luzula bulbosa (Wood) Rydb.

Liliaceae
Allium canadense L.
A. vineale L.
Nothoscordum bivalve (L.) Britt.
Ornithogalum umbellatum L.

Yucca filamentosa L.
Asparagus officinalis L.
Polygonatum biflorum (Walt.) Ell.
Smilax rotundifolia L.
S. bona-nox L.
** S. tamnoides L.

Dioscoreaceae
Dioscorea quaternata (Walt.) J.F. Gmel.

Amaryllidaceae
Narcissus pseudo-narcissus L.
Zephyranthes atamasco (L.) Herb.
Hypoxis hirsuta (L.) Coville

Iridaceae
Sisyrinchium angustifolium Mill.
** Iris prismatica Pursh
I. virginica L.

Orchidaceae
Cypripedium acaule Ait.
* Habenaria cristata (Michx.) R.Br.
*** Spiranthes odorata (Nutt.) Lindl.
Goodyera pubescens (Willd.) R.Br.
* Listera australis Lindl.
Malaxis unifolia Michx.
Liparis lilifolia (L.) Richard
Tipularia discolor (Pursh) Nutt.

Salicaceae
Salix nigra Marsh.

Myricaceae
Myrica cerifera L.

Juglandaceae
Juglans nigra L.
Carya illinoensis (Wang.) K.Koch
C. tomentosa Nutt.
**a C. glabra (Mill.) Sweet

Corylaceae
Carpinus caroliana Walt.
Alnus serrulata (Ait.) Willd.

Fagaceae
Fagus grandifolia Ehrh.
Quercus alba L.
Q. stellata Wang.
* Q. palustris Muenchh.
Q. velutina Lam.
**a Q. falcata Michx. var. falcata
* var. pagodaefolia Ell.

Quercus marilandica Muenchh.
* Q. laurifolia Michx.
Q. phellos L.

Ulmaceae
Ulmus rubra Muhl.
U. americana L.
U. alata Michx.
Celtis occidentalis L.

Moraceae
Morus rubra L.
M. alba L.

Urticaceae
Boehmeria cylindrica (L.) Sw.

Polygonaceae
Rumex verticillatus L.
R. crispus L.
R. conglomeratus Murr.
R. acetosella L.
Tovara virginiana (L.) Raf.
Polygonum pensylvanicum L.
P. punctatum Ell.
*** P. opelousanum Riddell var. adenocalyx Stanford
*a P. sagittatum L.
* P. arifolium L.

Chenopodiaceae
Chenopodium ambrosioides L.

Amaranthaceae
Acnida cannabina L.

Phytolaccaceae
Phytolacca americana L.

Portulacaceae
Claytonia virginica L.

Caryophyllaceae
Stellaria media (L.) Cyrillo var. media
Cerastium vulgatum L.
C. viscosum L.
*a Silene stellata (L.) Ait.f.
S. caroliniana Walt. var. pensylvanica (Michx.) Fern.
Saponaria officinalis L.
Dianthus armeria L.

Ceratophyllaceae
** Ceratophyllum echinatum Gray

Ranunculaceae

* Ranunculus pusillus Poir.
R. sceleratus L.
R. abortivus L. var. abortivus
R. bulbosus L.
R. parviflorus L.
Clematis dioscoreifolia Levl.& Vaniot var. robusta (Carr.) Rehd.

Berberidaceae

Podophyllum peltatum L.
Berberis thunbergii DC.

Magnoliaceae

Magnolia grandiflora L.
Liriodendron tulipifera L.

Lauraceae

Persea borbonia (L.) Spreng.
Sassafras albidum (Nutt.) Nees
Lindera benzoin (L.) Blume

Papaveraceae

Sanguinaria canadensis L.
Fumaria officinalis L.

Cruciferae

Draba verna L.
Lepidium virginicum L.
Capsella rubella Reut.
Brassica napus L.
Arabidopsis thaliana (L.) Heynh.
Barbarea vulgaris R.Br. var. vulgaris
B. verna (Mill.) Aschers.
Cardamine hirsuta L.

Hamamelidaceae

Liquidambar styraciflua L.

Platanaceae

Platanus occidentalis L.

Rosaceae

Spiraea prunifolia Sieb.& Zucc.
Pyrus arbutifolia (L.) L.f.
Amelanchier canadensis (L.) Medic.
Duchesnea indica (Andr.) Focke
Potentilla canadensis L.
**a Rubus phoenicolasius Maxim.
Agrimonia rostellata Wallr.
**a Rosa multiflora Thunb.
R. wichuraiana Crepin
R. eglanteria L.
R. micrantha Sm.

Rosa palustris Marsh.
Prunus armeniaca L.
P. avium L.
P. serotina Ehrh.

Leguminosae
Albizzia julibrissin Durazzini
Gleditsia triacanthos L.
Cassia fasciculata Michx.
C. nictitans L.
Cercis canadensis L.
Baptisia tinctoria (L.) R.Br.
Cytisus scorarius (L.) Link
Trifolium arvense L.
T. pratense L.
T. repens L.
T. procumbens L.
Melilotus alba Desr.
Medicago lupulina L.
Tephrosia sp.
Robinia pseudo-acacia L.
Desmodium nudiflorum (L.) DC.
D. viridiflorum (L.) DC.
Lespedeza repens (L.) Bart.
*a L. cuneata (Dumont) G.Don
Stylosanthes biflora (L.) BSP.
**a Vicia lathyroides L.
V. angustifolia Reichard var. uncinata (Desv.) Rouy
V. hirsuta (L.) S.F.Gray
*** V. dasycarpa Ten.
** Lathyrus hirsutus L.
Apios americana Medic.
Strophostyles umbellata (Muhl.) Britt.
**a Clitoria mariana L.
Centrosema virginianum (L.) Benth.
Amphicarpa bracteata (L.) Fern.

Oxalidaceae
Oxalis violacea L.
**a O. stricta L.
**a O. europaea Jord.

Geraniaceae
Geranium carolinianum L.
** G. molle L.

Simaroubaceae
Ailanthus altissima (Mill.) Swingle

Meliaceae
Melia azedarach L.

Polygalaceae
Polygala mariana Mill.

** Polygala verticillata L. var. ambigua (Nutt.) Wood

Euphorbiaceae
*a Acalypha gracilens Gray
Euphorbia corollata L.

Anacardiaceae
Rhus copallina L.
R. radicans L.

Aquifoliaceae
Ilex opaca Ait.
** I. decidua Walt.

Celastraceae
Euonymus americanus L.

Aceraceae
Acer platanoides L.
A. rubrum L.
A. saccharinum L.
A. negundo L.

Balsaminaceae
Impatiens capensis Meerb.

Rhamnaceae
* Berchemia scandens (Hill) K.Koch

Vitaceae
Parthenocissus quinquefolia (L.) Planch.
P. inserta (Kerner) K.Fritsch
Vitis aestivalis Michx.
V. vulpina L.

Malvaceae
Kosteletzkya virginica (L.) Presl
Hibiscus palustris L. forma Peckii House

Guttiferae
Ascyrum hypericoides L.
Hypericum punctatum Lam.
H. mutilum L.
** H. gymnanthum Engelm.& Gray

Cistaceae
** Hudsonia tomentosa Nutt.
Lechea racemulosa Michx.

Violcaeae
Viola papilionacea Pursh
V. affinis Le Conte
V. fimbriatula Sm.
V. triloba Schwein.

** Viola stoneana House
V. kitaibeliana R.& S. var. rafinesquii (Greene) Fern.

Passifloraceae
Passiflora lutea L.
P. incarnata L.

Cactaceae
* Opuntia humifusa Raf.

Lythraceae
Decodon verticillatus (L.) Ell.
Lagerstroemia indica L.
Lythrum lineare L.

Nyssaceae
Nyssa sylvatica Marsh.

Melastomataceae
** Rhexia ventricosa Fern.& Grisc.

Onagraceae
Ludwigia alternifolia L.
** L. palustris (L.) Ell. var. nana Fern.& Grisc.
Oenothera biennis L.
O. laciniata Hill
Circaea quadrisulcata (Maxim.) Franch.& Sav.
var. canadensis (L.) Hara

Araliaceae
Aralia spinosa L.
Hedera helix L.

Umbelliferae
* Hydrocotyle verticillata Thunb. var. verticillata
** var. triradiata
(A. Richard) Fern.
* Centella erecta (L.f.) Fern.
Sanicula canadensis L.
** Eryngium aquaticum L.
** Chaerophyllum tainturieri Hook.
Cicuta maculata L.
Sium suave Walt.
Ptilimnium capillaceum (Michx.) Raf.
Lilaeopsis chinensis (L.) Ktze.
Foeniculum vulgare Mill.
Daucus carota L.

Cornaceae
Cornus florida L.

Pyrolaceae
Chimaphila maculata (L.) Pursh
Monotropa uniflora L.

Ericaceae
- Oxydendrum arboreum (L.) DC.
- Epigaea repens L. var. repens
- Gaylussacia frondosa (L.) T.& G.
- G. baccata (Wang.) K.Koch
- Vaccinium stamineum L.
- ** V. caesariense Mackenz.
- V. atrococcum (Gray) Heller

Primulaceae
- Lysimachia quadrifolia L.
- Anagallis arvensis L.
- Samolus parviflorus Raf.

Ebenaceae
- Diospyros virginiana L.

Oleaceae
- ** Fraxinus americana L. var. biltmoreana (Beadle) J.Wright
- F. pennsylvanica Marsh.
- Ligustrum vulgare L.
- L. sinense Lour.

Loganiaceae
- Polypremum procumbens L.

Gentianaceae
- Sabatia angularis (L.) Pursh
- S. stellaris Pursh forma albiflora Britt.
- S. dodecandra (L.) BSP.

Apocynaceae
- Apocynum cannabinum L.

Asclepiadaceae
- Asclepias tuberosa L.
- ** A. lanceolata Walt.
- A. incarnata L.
- A. variegata L.
- ** Gonolobus suberosus (L.) R.Br.

Convolvulaceae
- Ipomoea hederacea (L.) Jacq.
- * Cuscuta campestris Yuncker

Boraginaceae
- Cynoglossum virginianum L.
- Myosotis verna Nutt.
- *** M. stricta Link
- Hackelia virginiana (L.) I.M. Johnston

Verbenaceae
- Verbena urticifolia L. var. urticifolia
- ** Lippia lanceolata Michx.

Callicarpa americana L.

Labiatae

Trichostema dichotomum L.
Teucrium canadense L.
Scutellaria elliptica Muhl.
S. integrifolia L.
Glechoma hederacea L. var. micrantha Moricand
Prunella vulgaris L.
Lamium amplexicaule L.
Salvia lyrata L.
Satureja calamintha (L.) Scheele var. nepeta (L.) Briq.
** Pycnanthemum tenuifolium Schrad.
Mentha arvensis L.

Solanaceae

** Solanum americanum Mill.
S. carolinense L.
*** Physalis heterophylla Nees var. nyctaginea (Dunal) Rydb.

Scrophulariaceae

Verbascum thapsus L.
**a V. blattaria L.
* Kickxia elatine (L.) Dumort.
Linaria canadensis (L.) Dumont var. texana (Scheele) Pennell
Paulownia tomentosa (Thunb.) Steud.
Bacopa acuminata (Walt.) Robins.
** Veronica serpyllifolia L.
V. arvensis L.
V. persica Poir.
** V. hederaefolia L.
Gerardia purpurea L. forma purpurea forma albiflora Britt.
G. setacea (Walt.) J.F. Gmel
**a G. virginica (L.) BSP.

Bignoniaceae

Campsis radicans (L.) Seem.
Bignonia capreolata L.
Catalpa speciosa Warder

Acanthaceae

* Justicia americana (L.) Vahl
Ruellia caroliniensis (Walt.) Steud.

Plantaginaceae

Plantago rugelii Dcne.
P. lanceolata L.
P. aristata Michx.
P. virginica L.

Rubiaceae

Sherardia arvensis L.

Galium aparine L.
G. triflorum Michx.
G. pilosum Ait. var. puncticulosum (Michx.) T.& G.
G. tinctorium L.
*a G. uniflorum Michx.
Diodia virginiana L.
D. teres Walt.
Mitchella repens L.
Cephalanthus occidentalis L.
Houstonia caerulea L.

Caprifoliaceae
Lonicera japonica Thunb.
Viburnum prunifolium L.
Sambucus canadensis L.

Valerianaceae
Valerianella olitoria (L.) Poll.
V. radiata (L.) Dufr.

Cucurbitaceae
Melothria pendula L.

Campanulaceae
*a Specularia perfoliata (L.) A. DC.
Lobelia cardinalis L.
L. puberula Michx.
L. inflata L.

Compositae
* Vernonia noveboracensis (L.) Michx. var. noveboracensis
Elephantopus carolinianus Willd.
E. tomentosus L.
Eupatorium capillifolium (Lam.) Small
E. album L.
E. serotinum Michx.
E. rugosum Houtt.
** E. aromaticum L.
E. coelestinum L.
Mikania scandens (L.) Willd.
Liatris graminifolia (Walt.) Willd.
Chrysopsis graminifolia (Michx.) Ell.
C. mariana (L.) Ell.
Solidago bicolor L.
S. sempervirens L.
* S. pinetorum Small
**a S. juncea Ait.
S. rugosa Ait. var. aspera (Ait.) Fern.
** var. celtidifolia (Small) Fern.
S. altissima L.
S. graminifolia (L.) Salisb. var. Nuttallii (Greene) Fern.
** S. microcephala (Greene) Bush
**a Aster pilosus Willd. var. pilosus

Aster pilosus Willd. var. pilosus forma pulchellus Benke
A. dumosus L.
A. tenuifolius L.
A. subulatus Michx. var. euroaster Fern.& Grisc.
Erigeron philadelphicus L.
E. annuus (L.) Pers.
**a E. strigosus Muhl.
**a E. canadensis L.
Baccharis halimifolia L.
** Pluchea foetida (L.) DC.
** P. purpurascens (Sw.) DC. var. purpurascens
P. camphorata (L.) DC.
Antennaria parlinii Fern.
A. plantaginifolia (L.) Hook.
Gnaphilium purpureum L.
Iva frutescens L.
Ambrosia artemisiifolia L.
** Xanthium strumarium L.
Polymnia uvedalia L.
Eclipta alba (L.) Hassk.
Verbesina occidentalis (L.) Walt.
Bidens laevis (L.) BSP.
B. frondosa L.
** B. discoidea (T.& G.) Britt.
B. coronata (L.) Britt.
**a B. bipinnata L.
Helenium autumnale L.
Achillea millefolium L.
Anthemis arvensis L.
Chrysanthemum leucanthemum L. var. pinnatifidum Lecoq.& Lamotte
Arnica acaulis (Walt.) BSP.
Erechtites hieracifolia (L.) Raf.
Senecio tomentosus Michx.
S. smallii Britt.
S. aureus L.
Cirsium vulgare (Savi) Tenore
C. horridulum Michx.
C. discolor (Muhl.) Spreng. forma discolor forma albiflorum (Britt.) House
Cichorium intybus L.
Krigia virginica (L.) Willd.
** K. dandelion (L.) Nutt.
Hypochoeris radicata L.
Taraxacum officinale Weber
Sonchus asper (L.) Hill
Lactuca canadensis L.
Pyrrhopappus carolinianus (Walt.) DC.
** Hieracium pratense Tausch
H. venosum L.
H. gronovii L.

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